THE ROLE OF NONVERBAL BEHAVIOR IN LEADERSHIP EFFECTIVENESS:

A multi-method, video-observational study

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The role of nonverbal behavior in leadership effectiveness: A multi-method, video-observational study

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Nonverbal communication is an elaborate secret code that is written nowhere, known by none, and understood by all (Sapir, 1927, p. 556)

ABSTRACT:

This field study examines what specific nonverbal behaviors of leaders are related to expert perceptions of leadership effectiveness. In a multi-method observational study, we analyzed the nonverbal behaviors of 40 managers using three randomly selected 10-second video-segments, that were sampled from 40 regularly held staff meetings with team members. The nonverbal behaviors of these leaders, who work in one Dutch public-service organization, were meticulously code by a group of trained research assistants: using a new, self-developed coding scheme. Analysis of these video-segments revealed that leaders who gaze more towards their followers, scored *higher* in terms of leadership effectiveness. In contrast, leader instances of smiling behavior were *negatively* related to leadership effectiveness. Implications for theory and practice are discussed, as well directions for future research.

Keywords*: Effective leadership, nonverbal leadership behavior, leadership communication, leadership behaviors, staff meetings.*

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CHAPTER 1: INTRODUCTION

In the previous decades, the organizational landscape is characterized by increased globalization, intensified competition, and a more complex environment (Brooks, Weatherston, & Wilkinson, 2011). Concurrently, the focus on sustainable competitive advantage has further shifted from physical and capital assets towards adequate funneling of intellectual capital, which includes a massive increase in organizational behavioral research on the importance of leadership for organizational success (Halawi, Aronson, & McCarthy, 2005; Dinh et al., 2014). Leadership plays an essential role in dealing with these intensified circumstances (Kumari, Usmani, & Hussain, 2015). Khan and Anjum (2013) accredit leadership as the spine of the organization and an important source to realize competitive advantage. Effective leadership could contribute to the achievement of organizational goals, whereas ineffective leadership (e.g., leaders who do not meet the needs of their followers due to their narcissistic tendencies) leads not only to dissatisfaction and absence amongst employees, but also induces poor decision making and inadequate response to customers and markets, leading to organizational failure (Müller & Raich, 2005; Yukl, 2013). Noureddine (2015, p. 65) describes effective leadership as; "the ability to influence, motivate, and direct others to achieve expected goals". The effectiveness of a leader depends to a large extent on the social influence of the leader, which is a result of the communication and relationships with its followers (Engle & Lord, 1997). Perceptions of leadership effectiveness are to a large extent shaped in staff meetings, where generally a substantial share of the communication between leader and followers takes place (Perkins, 2009).

The social circumstances in the workplace are of significant influence on the attitudes and demeanor of employees, and furthermore, positive interactions and the establishment of a strong connection between leaders and other workers positively influence organizational performance (Salancik & Pfeffer, 1978; Stephens, Heaphy, & Dutton, 2012; Darioly & Schmid Mast, 2014). Hence, strong communicative capabilities are of crucial importance in for effective leadership, and the organizational behavior literature calls for further research concerning the influence of a leaders communication on organizational related outcomes such as leadership and team effectiveness (Bellou & Gkorezis, 2016; Gardner & Avolio, 1998; Mayfield & Mayfield, 2007). These human interactions occur by means of verbal- and non-verbal communication, and especially the nonverbal aspect is unexposed in relation with the leadership context. Previous

research was primarily focussed on the verbal communications of leaders (e.g., Hoogeboom & Wilderom, 2015a), yet we know surprisingly little about the role of nonverbal behavior for effective leadership (Talley & Temple, 2015).

This absence of academic research on the relation between nonverbal behavior and effective leadership is quite remarkable. It is known, by courtesy of decades of academic research in the field of communication and psychology, that nonverbal expressions transmit a substantial quantity of social information and facilitate the establishment and maintenance of relationships in human interactions (Bonaccio, O'Reilly, O'Sullivan, & Chiocchio, 2016). Leaders should utilize nonverbal expressions for the following reasons: (1) nonverbal behavior such as pitch alteration (voice) and the utilization of hand gestures while talking, facilitates the construction of trust and cohession in relationships, (2) nonverbal behavior helps to influence followers to meet their needs and (3) pursue followers towards organizational objectives, which makes nonverbal behavior of significant relevance for organizational leadership (Burgoon, Birk, & Pfau, 1990; Yukl, 2013; Bellou & Gkorezis, 2016). Furthermore, Additionally, the most promising element for practitioners comprises the potential trainability of certain nonverbal expressions (Towler, 2003; Frese, Beimel, & Schoenborn, 2003). This sparks the question what nonverbal behaviors a leader should expose to be effective? In their book chapter on nonverbal behavior, Darioly and Schmid Mast (2014, p. 26) state that ”additional research is needed and leader nonverbal behaviors training is important to reach individual, leadership, and organizational effectiveness. Thus, the future for nonverbal behaviors research in the leadership context and for leader development seems encouraging”.

It is notable that in recent years popular management's outlets acknowledged the appeal of organizational leadership scholars. These outlets devoted more attention to the topic by publishing articles which recognize and underline the significance of the nonverbal behavior of leaders (Bonaccio et al., 2016). To illustrate, Forbes blog published multiple articles analyzing the nonverbal behavior of President Trump appearances during and after the election period. For instance, Goman (2016) analyzed the nonverbal behavior of Donald Trump during a press conference with Barack Obama. She concluded that Trump was distressed because he compressed his lips multiple times (Goman, 2016). Moreover, Forbes blog also published articles concerning how to express confidence in the workplace, how leaders build trust and increase their effectiveness by using nonverbal behavior (Smith, 2013; Goman, 2011; Goman, 2016).

Considering the apparent interest of practitioners on the subject matter, it is remarkable to see the scientific literature slack on this topic (Bonaccio et al., 2016). In organizational behavior literature, we found a relatively small amount of empirical studies focusing on the relation between specific nonverbal behaviors of a leader and leadership effectiveness. Furthermore, the literature demands more objective and reliable methods to measure and identify effective nonverbal leadership behaviors (Bonaccio et al., 2016; Day & Antonakis, 2012). The demand for more reliable methods stems from the fact that studies use surveys to obtain *perceptions* of leadership behavior from employees (a technique which is criticized because of various empirical limitations[1]), instead of focussing on actual, observable behaviors (Van der Weide & Wilderom, 2004; Yukl, 1999; Yukl, 2013). For that reason, Van der Weide and Wilderom (2004) argued for the usage of video observation to measure the behavior of leaders. Coding leader's actual behaviors provides a more reliable method and is a more detailed approach to identify behaviors which impact leadership effectiveness (Hoogeboom & Wilderom, 2015a). We found a conspicuous absence of existing research regarding the examination of nonverbal leadership behavior in a field setting using this methodology, despite the insistence of the literature. Our objective, therefore, is to identify specific nonverbal behaviors which impact leadership effectiveness by applying a multi-method observational video study in a field setting. Therefore, the research question of the current research is proposed as following; **What specific nonverbal behaviors of leaders, displayed during staff meetings, are related to leadership effectiveness as perceived by both their followers and leadership experts?**

This thesis is structured as follows: First, we will elaborate on the concept of leadership effectiveness and its significance for organizational success. Next, we discuss the phenomena of nonverbal behavior. Then the hypotheses of the current research will be presented, and subsequently the current study we conducted. Next, the results of the present study are presented and discussed. To conclude, implications for theory and practice are discussed.

[1] e.g., Shondrick, Dinh and Lord (2010., p. 966) for instance state that such questionnaires "reflect the rater's information processing rather than the leader's actual behaviors "

CHAPTER 2: THEORETICAL FRAMEWORK

2.1 Leadership

2.1.1 Importance of effective leadership

Effective leadership remains a popular topic of organizational researchers and practitioners. The interest for the subject derives from the impact of leadership on organizational prosperity. Effective team leadership is one of the pillars of team effectiveness and organizational success (Zaccaro, Rittman, & Marks, 2001). Almost every team incorporates one or more leaders, who can be described as individuals who (co-) guide the team and who are responsible for the performance of the team (Zaccaro et al., 2001). A leader affects a team's effectiveness by his ability to influence the members (e.g. by providing directions, establish group goals and motivate followers) (Day & Antonakis, 2012; Zaccaro et al., 2001).

Furthermore, Irving and Longbotham (2007) note that effective leadership enhances the realization of shared objectives and is, therefore, beneficial for organizational prosperity. In addition, numerous scholars and practitioners acknowledge and emphasize the importance and impact of effective team leadership on team dynamics (Forsyth, 2014; McGrath, 1984); follower self-esteem (McCroskey, Richmond, Daly, & Falcione, 1977); and organizational performance (Riggio, 2008). Hence, it can be concluded that in the present-day environment effective leadership is an important source of competitive advantage (Khan & Anjum, 2013).

2.1.2 What is leadership effectiveness?

Whereas organizational scholars and practitioners unmistakable reckon with the importance of effective leadership, the definition of leadership effectiveness is not unambiguous. Ask random people to give a description of effective leadership, and they will give highly divergent answers. This phenomenon is also present in the literature (Yukl, 2013). Effective leadership is often differently defined, and even the definitions of academics are often dissimilar (Yukl, 2013). Riggio (2016, p. 1) noted that there are hundreds of multifarious definitions of leadership, which almost all include the same elements. He states that "leadership is most commonly defined as the ability to move collectives toward the attainment of goals". An example of a description of effective leadership is given by Noureddine (2015, p. 65), who describes effective leadership as

“the ability to influence, motivate, and direct others to achieve expected goals”. This definition is in line with the depiction of effective leadership by Yukl (2012, p. 66); “the essence of leadership in organizations is influencing and facilitating individual and collective efforts to accomplish shared objectives ". Another similar description is given by the MLQ (multifactor leadership questionnaire, which is the most commonly used measurement instrument to measure perceived leadership effectiveness). The MLQ sees leadership effectiveness as (1) the leader’s ability to lead the team effectively, (2) the leader’s ability to satisfy the work related needs of the followers, (3) the leader’s ability to contribute to and meet the organizational goals; and (4) the leader’s ability to represent the teams interests in higher hierarchal levels (Kolesnikova & Mykletun, 2012; Avolio & Bass, 1995). The essence of these three aspects is illustrated by effective interactions between leaders and followers, with the intention to socially influence the followers towards a shared objective. This management responsibility is one of the key activities of a leader (Yukl, 2013). The intention to achieve expected goals or shared objectives by means of influencing and motivating followers emphasizes the organizational relevance of leadership. As a result of the importance of effective leadership, many practitioners and popular management outlets publish about the practical essence of effective leadership, and likewise the factors which influence a leader’s effectiveness (Feser, Mayol, & Srinivasan, 2015; Groysberg & Slind, 2012).

2.1.3 Factors influencing leadership effectiveness

In the above-described paragraphs, the definition and importance of leadership effectiveness is underlined. It is essential to be aware of the importance of leadership, but it is also crucial to know what factors influence the effectiveness of a leader. Therefore, the following section will describe the factors that affect a leader's effectiveness.

In the previous decades, there have been several paradigms regarding the factors which predict leadership effectiveness. The first studies regarding leadership explained effectiveness by genetic characteristics of leaders and the lack of these in non-leaders (Galton, 1980). This was the start of the so-called trait paradigm in the field of leadership studies, which ascribes leadership effectiveness to certain traits (Judge, Piccolo, & Kosalka, 2009). Later studies regarding traits (e.g. abilities (intelligence) or personality (extraversion)) confirmed the influence of certain traits on leadership effectiveness (Judge, Colbert, & Ilies, 2004; Judge, Bono, Ilies, & Gerhardt, 2002). However, critics of the traits paradigm pointed towards the influence of the behavior of leaders on

the effectiveness and initiated the behavior paradigm (DeRue, Nahrgang, Wellman, & Humphrey, 2011). Based on the behavior paradigm several notable leadership theories have emerged, of which transformational leadership- and transactional leadership theory have received considerable academic attention (e.g. transformational and transactional leadership) (e.g., Bass, 1990). Recent studies provided empirical results which support the behavioral paradigm (DeRue et al, 2011; Piccolo, Bono, Heinitz, Rowold, Duehr, & Judge, 2012). For instance, findings by DeRue and colleagues (2011) signify that both traits and behaviors of a leader predict the effectiveness. Nevertheless, the leader's behavior explains more variance than the traits regarding leadership effectiveness. This stresses the importance of leadership behaviors and implies that the identification of effective leadership behaviors can contribute to theoretical and practical purposes. DeRue and colleagues (2011, p. 40) declare, regarding these findings, the following " given that behaviors can be learned and developed, this finding highlights the need for more research on what individuals and organizations can do to develop leaders' ability to exhibit such behaviors ". Numerous studies support the findings of DeRue and colleagues (2011) and acknowledge the impact of the leader's behavior. Still, there are various other influences on leadership effectiveness. DuBrin (2016) states that leadership effectiveness is a combination of (1) leader characteristics, behavior and leadership style, (2) group member characteristics and behavior and (3) internal and external environment, as the model below proposes. A leader does not have a direct influence on (1) the characteristics and behaviors of group members, and (2) the internal and external environment (DuBrin, 2016). However, a leader is able to control his own behavior and leadership style. Furthermore, the leader should adapt to the followers and context with his own behavior to be effective, which indicates that effective leadership is a dynamic process (Reicher, Haslam, & Hopkins, 2005). Hence, it can be concluded that the effectiveness of a leader depend to a large extent on the behavior he or she displays (Yukl, 2012).

2.1.4 Behavior and leadership effectiveness

According to Yukl (2012, p. 66), the essence of leadership in organizations is "influencing and facilitating individual and collective efforts to accomplish shared objectives". The description of Yukl accentuates the social cognitive process of leadership behavior, detached from the knowledgeable skills, which influences the perception of followers and supervisors (Yan & Hunt, 2005). Given that prior research has shown that especially the observable, day-to-day behavior of

leaders has a large impact on their effectiveness, what exactly do we mean when we talk about 'leadership behavior'?

Behavior can be seen as a synonym of cue, which is defined by Cooksey (1996, p. 368) as "any numerical, verbal, graphical, pictorial, or other sensory information which is available to a judge for potential use in forming a judgement". There are numerous definitions of leadership behavior defined and regarding the remainder of this thesis, the following definition, as proposed by Van Dun, Hicks and Wilderom (2016, p. 2), will be applied: "specific observable verbal and nonverbal actions of managers in interaction with their followers in an organizational setting".

Yukl (2012) published a taxonomy of the behaviors which effective leaders utilize to enhance their effectiveness. He identified four main categories, with each its own purpose and own sub-categories. Yukl (2012) distinguishes (1) task-oriented leadership behavior, intended to ensure efficient usage of resources to realize the work related goals, (2) relation-oriented leadership behavior, intended to improve the skills, commitment and relationship with/of the followers, (3) change-oriented leadership behavior, intended to enhance innovation and acceptance of changes, (4) external leadership behavior, intended to enhance team performance by providing information regarding external events or promoting the reputation of the team externally. The way a leader fulfills and realize, these behaviors shape the work atmosphere and influences accordingly the perception, commitment and effectiveness of the followers (Otara, 2011; Mahdi, Mohd, & Almsafir, 2014; Yukl, 2012).

The significance of these behaviors is portrayed by findings of Peterson (1997) and Peterson and colleagues (2003). They showed that the behavior of the chief executive affects the revenue and financial performance. These findings signify that the behavior which a leader exposes is of significant importance (Perkins, 2009). Followers' perceptions of their leader is thus shaped by the communicative behavior of the leader (Whitaker, Whitaker, & Lumpa, 2009). It is possible that a leader has the best intentions concerning the followers, but if the leader does not express and reveal these intentions through his behavior towards the followers, their perceptions might be formed in contradiction with the motives of the leader (Otara, 2011). These interactions between leader and follower occur by means of verbal and nonverbal behavior (NVB) (Darioly & Schmid Mast, 2014). The combined verbal and nonverbal expressions regulate the complete communicative process, including the processes of social influence (Kendon, 2004; Maricchiolo, Livi, Bonaiuto, & Gnisci, 2011). Often, these communications take place during meetings; Perkins

(2009), for instance, states that perceptions of leadership effectiveness are shaped during staff meetings, where generally a substantial share of the communication between leader and followers takes place.

2.1.5 Meetings and the behavior of leaders

Meetings are ubiquitous in contemporary organizational life. Swartzman (1986, p. 234) defined meetings as "pre-arranged gatherings of two or more individuals for the purpose of work-related interaction". Managers invest 25-80% of their time towards staff meetings, and employees spend on average six hours per week participating in meetings (Rogelberg, Leach, Warr, & Burnfield, 2006). In addition, a study of Rogelberg, Scott, and Kello (2007) showed that senior managers weekly spend 23 hours in meetings, and it is likely that this will increase in the future. All these findings indicate that a substantial quantity of time is spent on meetings, but why? Various scholars answer this question by deducing that meetings are essential for achieving organizational goals and likewise underline the importance of leadership behavior during these meetings (e.g., Lehmann-Willenbrock & Kauffeld, 2012). For example, Poel, Poppe, and Nijholt (2008) state that the NVB which a leader exposes during a meeting is of significant impact on the success of the meeting. Furthermore, various scholars state that the evaluation of leadership effectiveness is based upon the leader's appearance in these meetings (Raes, Glunk, Heijltjes, & Roe, 2007; Romano & Nunamaker, 2001). All these findings flag the importance of effective leadership behavior in staff meetings, but also raises questions regarding the function of the staff meeting, the role of the leader during these staff meetings and, most importantly, what behaviors enhances leadership effectiveness during staff meetings?

The staff meetings in question have various functions, e.g. exchange information, decision making and building commitment (Perkins, 2009). Leaders chairing these meetings are responsible to facilitate various processes such as turn taking, decisions making and pointing the direction of the meeting (Allen & Rogelberg, 2013). Various scholars underline the importance and impact of verbal- and non-verbal leadership behaviors during meetings (Poel, Poppe, & Nijholt, 2008; Molin, 2012). Rogelberg and colleagues (2006) showed that meetings have a significant impact on the attitudes of followers, for example, negative experiences during these meetings significantly affect negative follower's attitudes (e.g. intentions to quit and job satisfaction). As a consequence, inadequate leadership during these meetings produces undesirable outcomes (e.g. disengagement

of followers, reduced satisfaction and innovation and increased number of conflicts between team members) (Perkins, 2009). In sum, it can be concluded that the behaviors of leaders in these meeting influences leader and team effectiveness (Allen, Lehmann- Willenbrock, & Rogelberg, 2015). Thus, the success of an organization may be considerable, although indirectly, affected by the capability of a leader to chair a staff meeting (Perkins, 2009). Hence, it is important to examine what behaviors in meetings contribute to leadership effectiveness.

2.1.6 Measuring leadership effectiveness

The preceding section underlined the significance of leader's behaviors in meetings in relationship with leadership effectiveness. To examine this relation, it is critical to have objective measures of leadership effectiveness and the leader's behavior in such meetings. The following section will elucidate on the obtainment of these aspects.

Leadership effectiveness relates to the evaluation of the desired influence of a leader concerning the performance. Leadership effectiveness is often measured by judgements of followers, peers or supervisors (Hogan, Curphy, & Hogan, 1994), for instance by means of the multifactor leadership questionnaire (MLQ) (Avolio & Bass, 1995). The multifactor leadership questionnaire examines, besides measuring leadership effectiveness, numerous aspects of leadership (e.g. leadership style and behavior). The questionnaire is easy to utilize and could assess the effectiveness perceptions of all layers of the organizations (followers, peers, and supervisors). However, some researchers express criticism on this measurement method of leadership effectiveness. Yukl (1999) declares that the method is too subjective and Van der Weide and Wilderom (2004) argue for a more objective measurement of effective leadership behavior. Various leadership studies indicated that perceptions of behaviors of other individuals are biased by different aspects (e.g. personality and gender) (Martell & DeSmet, 2001; Shondrick, Dinh, & Lord, 2010). This might limit an individual's ability to objectively observe and rate the effectiveness of the of leaders.

Shondrick and colleagues (2010) plead for an event-based measurement to obtain the behaviors of leaders. The usage of video observations fulfills this requirement and provides an objective and accurate measure of leadership behaviors. By using video recordings of the meeting, the identification of the behaviors of leaders is utilized by coding the behaviors of the leaders according to a coding scheme. For more information regarding the topic of coding schemes, see

Appendix B. An example of the usage of this method is given by Van der Weide and Wilderom (2004). In order to measure the behaviors of middle managers, they developed a behavioral coding scheme existing of 28 behaviors. This coding scheme is built upon academic literature with the objective to identify effective observable leadership behaviors of middle managers.

In addition, the call from the academic leadership literature demand studies which combine objective observation methods with methods that measure perceptions of leadership (Hoogeboom & Wilderom, 2015a). Hoogeboom and Wilderom (2015a) describe this research design where the perception of leadership effectiveness is measured by the MLQ and actual leadership behaviors are measured by coding videotapes.

The current research will practice a similar methodology, but focuses on the identification of effective NVBs. Because, even though there are numerous studies stressing the impact of leadership on organizational prosperity, and some studies regarding the effect of a leader's behaviors on leadership effectiveness, the literature is very limited in regards to the relation between specific NVBs and leadership effectiveness. This is remarkable because various scholars have stressed, already a long time ago, the importance of NVB in human interactions (e.g., Ekman, 2004). As described in this chapter, human interaction is a crucial aspect of effective leadership. The effectiveness of a leader is affected by the interaction with his or her followers (e.g., by influencing the followers towards a shared objective). Although the importance of NVB on leadership effectiveness is evident, only a few empirical studies have identified specific NVBs that may enhance leadership effectiveness. The present study is intended to explore the relation between specific NVBs and leadership effectiveness to fill some of the gaps in the literature. The next section will introduce the topic of NVB and elucidate on the relevance of NVBs in relation to effective leadership.

2.2 Nonverbal Behavior

Every day people are exposed to the NVB of other individuals. But what do all these expressions implicate, and what can we learn from them? These questions were already asked a long time ago and gained the attention of biologist Darwin (1872), who was interested in the role of facial expressions in communication processes. Another early researcher is Sapir (1927, p. 556), he comments on the phenomenal of NVB as follows: "an elaborate secret code that is written nowhere, known by none, and used by all". Despite the increased interest in NVB over the last 70

years, there is still a lot unknown about NVB. Although, the literature signals that NVB is important in day to day communication, and likewise in leadership. For example, Poel, Poppe, and Nijholt (2008) state that the NVB which a leader exposes during a meeting is of significant impact on the success of the meeting. This statement raises questions regarding what specific NVBs contribute to the success of the meeting?

The previous chapter discussed the importance of effective leadership and accentuated the impact of a leader's behavior on the leader's effectiveness. This section will elaborate more in depth on the nonverbal side of effective leaders. It will detail the relevance and impact of the NVB of leaders in relation to leadership effectiveness. This will be preceded by defining NVB in the following section.

2.2.1 What is nonverbal behavior?

Darioly and Schmid Mast (2014, p. 74) state that "NVB refers to any behavior other than speech content". In a similar vein, Ambady and Weisbuch (2010, p. 465) defined nonverbal communication as "the sending and receiving of thoughts and feelings via nonverbal behavior." The divergence between verbal- and non-verbal behavior is not always apparent because some NVBs have a clear verbal meaning (e.g. nodding is in the Netherlands a sign of agreement, "yes") (Darioly & Schmid Mast, 2014). However, almost none of the available nonverbal expressions have an unambiguous definition (Darioly & Schmid Mast, 2014). NVB relates to a broad spectrum of behaviors, and many different taxonomies and classifications exist. For instance, Knapp, Hall, and Horgan (2014) differentiated speech-related NVB and speech-unrelated NVB. Speech rate and the duration of speech are examples of speech-related NVB. Speech-unrelated NVB are for instance head movements, postural openness and smiling behavior (Knapp et al., 2014). Figure 1 presents a taxonomy presents a systematic overview of the different nonverbal communication expressions as described by Knapp and colleagues (2014).

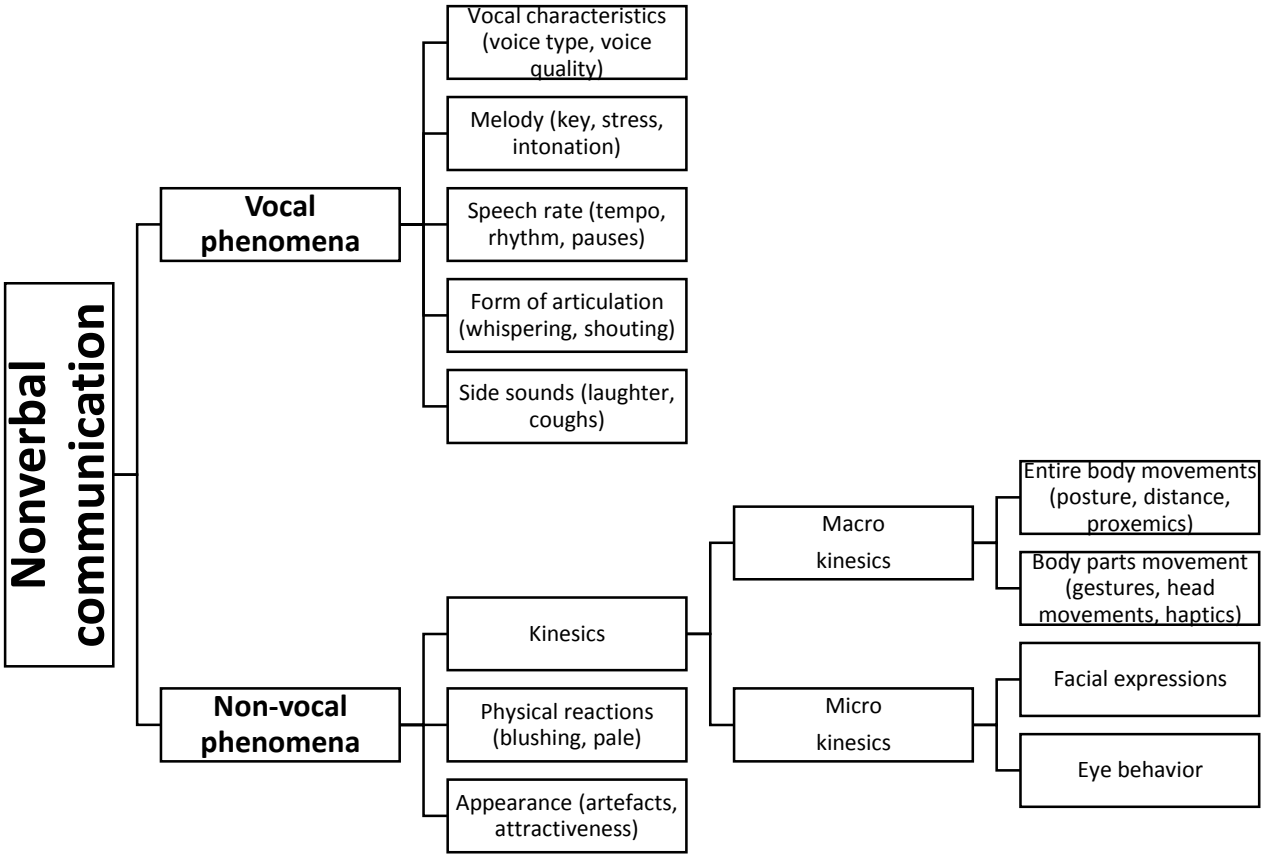

Figure 1 - Taxonomy of nonverbal behaviors. Adapted from Knapp, M. L., Hall, J. A., & Horgan, T. G. (2014). Nonverbal communication in human interaction. Wadsworth: Cengage Learning. Copyright 2014 by Cengage Learning

Verbal expressions are typically conscious planned and thought about, whereas NVB expressions are established on a lower level of consciousness (Poggi & Vincze, 2008). Humans, even when they are trained, are not able to plan and control all expression they exhibit, including for example, body postures, facial expressions, and gaze direction are projected in a reduced state of awareness (Poggi & Vincze, 2008). Nevertheless, these subconsciously produced expressions are a component of the communication which the transmitter reveals (Poggi & Vincze, 2008). Consequently, NVB could leak information that the sender does not want to show, for instance anxiety (Merola & Poggi, 2003). Ambady and Rosenthal (1998) describes a situation in the health care sector, where providers of health care derive information concerning the physical and mental well-being of clients from the NVBs of their clients. Ambady and Rosenthal (1998, p. 776) describes this process as "clients may not always say what they really feel, but their nonverbal cues might convey their true underlying feelings". The main message of the above is that NVB

cannot always be controlled, and this inability to control all nonverbal expressions could leak true feelings and attitudes (Ambady & Rosenthal, 1998). This might explain why in the case of an ambiguous situation, in which the verbal utterance is in contradiction with the NVB expression, individuals tend to rely on the nonverbal expressions as source of information (Darioly & Schmid Mast, 2014). The more ambiguity an individual experiences, the more an individual relies on the NVB of the sender (Darioly & Schmid Mast, 2014). Furthermore, when an individual questions the trustworthiness of the information provided by the verbal utterance, NVB becomes likewise the main source of information (Darioly & Schmid Mast, 2014; Mehrabian, 1972). These findings suggest that individuals perceive NVB as a reliable source of information. So, it hardly comes as a surprise that the perception of other people is partially shaped by their NVB.

This become apparent when individuals have their initial encounter. The ideas about the other person are, amongst other things, shaped by a combination of the verbal and nonverbal cues (Ambady, Hallahan, & Rosenthal, 1995; Hyde, 2005). Several studies examined the impact of NVB on communication and estimated that NVB gauges for 65 % to 90% of the interpretation transmitted in social interplay (Darioly & Schmid Mast, 2014; Crane & Crane, 2010). Based on the impressions people make judgements about others, which implies that individuals categorize other people into social categories, to reduce the complexity of the social environment we live in (Ambady, Bernieri, & Richeson, 2000). Thus, the impression of an individual's NVB influences the attitude concerning that individual and also affect the behavior towards this individual (Darioly & Schmid Mast, 2014). In the previous section, the foundation and background of NVB is clarified. Next, it is important to sketch the relevance of NVB for leadership contexts. Human interaction is both related to NVB and leadership, but what is the specific relevance of NVB in the leadership context?

2.2.2 Nonverbal behavior and leadership

Darioly and Schmid Mast (2014) state that encrypting and transmitting nonverbal communication to a leader's followers, peers and executives is an important part of the leadership role. This statement is in line with the social cognitive description of Yukl (2012) regarding leadership, which states that influencing and facilitating individuals is a critical element of leadership. This process of influencing and facilitating is supported by means of the NVB of a leader (Bonaccio et al., 2016).

Regarding the relevance of NVB in leadership, Darioly and Schmid Mast (2014) state that NVB communication is even more important than the verbal utterance in the leadership context. Adjacent, Mehrabian (1972) found that people distrust the verbal utterance when the NVB contradicts the verbal statement. These specified scholars stress the importance of the nonverbal abilities of a leader, which can be particularized as the skill to communicate nonverbal messages to followers, decode the NVB of followers and moderate their nonverbal expressions accordingly (Riggio, 2006). These capabilities are elements of the interpersonal skills, which are regarded as the abilities required and utilized to successfully communicate with others (Riggio, Riggio, Salinas, & Cole, 2003). Leaders can exploit these abilities to convey their power to attract the attention of their followers and endeavor to influence them through nonverbal persuasive behaviors (e.g., utilizing more exuberant facial expressions and more variety in their vocal pitch) (Darioly & Schmid Mast, 2014; Burgoon, Birk, & Pfau, 1990). A similar conclusion was drawn by Yukl (2013), he declares that effective leaders use their nonverbal abilities to build mutual trust and cohesion. These abilities can be learned, and there are trainings available to develop and enhance these skills (Riggio, 2008). In addition to the previous described skills, findings suggest that leaders who are capable to accurately read and translate NVB of others, and adapt their own behavior accordingly, display more often behaviors which fulfill the needs of their followers (Riggio & Reichard, 2008; Riggio, 1986, 2006). Subsequently, which might be a consequence of the above-described findings, the NVB of a leader also affect followers perceptions of leadership effectiveness (Darioly & Schmid Mast, 2014; Kaiser, Hogan, & Craig, 2008). To sum up, scholars stress the human interaction aspect of leadership. The NVB of a leader is crucial in this process by means of communicating with and influencing followers. Correspondingly, a leaders NVB affects the perception of leadership effectiveness. Another similar conclusion was made by Darioly and Schmid Mast (2014, p. 77), they stated: “Thus NVB is a crucial means through which interpersonal skills lead to effective leadership.”

Another interesting aspect was found by Carli and colleagues (1995), they observed that divergent nonverbal styles could influence perceptions of competence and likeability and therefore have a social influence on followers. Hence, previous studies demonstrated that perceived effective leadership is characterized by perceptions of multifarious aspects, as for instance supportiveness (Kim & Yukl, 1995), self-confidence (Yukl, 2013), trust (Mitchell & Ambrose, 2007) and honesty (Ciulla, 2004). DeGroot and colleagues (2011) showed that these perceptions of leaders could

mediate the relation between NVB and leadership effectiveness. Despite these findings, there is little known regarding the formation of the perceived leadership effectiveness; only a few researchers study this. These studies hint that the relation between NVB and perceived leadership effectiveness is mediated through aspects of, for instance, trustworthiness and credibility perceptions of the leader (DeGroot, Johnson, & Kluemper, 2011; Teven, 2007; Richmond & McCroskey, 2000). These perceptions are essential for the performance of the leader, because the power which a leader has is, amongst other things, depends on the perceptions of the followers (Maurer & Lord, 1991). Teven (2007) signifies that immediate nonverbal behavior of the leader results in more liking of the leader, which will be beneficial for the accomplishments of the leader. Teven (2007, p. 171) explains this phenomenal as "subordinates will simply work harder for a supervisor whom they like". Furthermore, Teven (2007) states that the persuasion of a leader is mediated by the credibility of a leader, because the credibility of a leader influence how the message is received and interpreted. The findings of Richmond and McCroskey (2000) are in line with Teven (2007), they asked 224 followers to judge the leader's nonverbal immediacy behaviors in a questionnaire and likewise rate aspects such as credibility, interpersonal attraction, affect towards the supervisor, motivation and job satisfaction. They found that increased displays of nonverbal immediacy behavior increased the perceptions of credibility, motivation and job satisfaction of the followers and accordingly the positive evaluation the leader. Furthermore, the increase in nonverbal immediacy behavior produced a more positive work climate and more beneficial results (Richmond & McCroskey, 2000).

In addition, Tjosvold (1984) simulated a cold and warm (nonverbal) interaction with a leader. In this simulation, the participants were asked to work together with a leader with the purpose to finish an assignment. In the cold condition, the leader exhibited interpersonal distance, avoided eye contact, stand-offish facial expressions and did not smile. Whereas in the warm condition the leader exhibited close interpersonal distance, eye contact, amiable facial expressions and smiled towards the participants. The warm leader was evaluated, in contrast with the cold leader, as helpful and the participants were more motivated and satisfied with the leader. These perceptions are instituted by the disclosure of certain nonverbal cues of the leader. In the study of Tjosvold (1984) the NVB functioned, amongst other things, to express intimacy. There are various other functions of NVB (Patterson, 2003). Some functions of NVB are related to the leadership context because they are aimed to influence and persuade followers (Bonaccio et al., 2016;

Burgoon, Birk, & Pfua, 1990). The following section will elaborate on the functions of NVB, specifically on the functions which are relevant for the leadership context.

2.2.3 The functions of nonverbal behavior

NVB is crucial for adequate interpersonal communication (Darioly & Schmid Mast, 2014), but it has various other functions. Patterson (2003) describes a taxonomy of the various functions of NVB, including (1) providing information; (2) regulating interactions; (3) expressing intimacy, (4) exercising influence; and (5) managing impressions. In daily life, the functions are employed in interaction with other individuals in order to chase personal goals (Patterson, 2003). Patterson (2003) concludes that nonverbal communication is an effective and pragmatic way of managing a person's social environment.

In the same vein, Bonaccio and colleagues (2016) differentiated the functions of NVB which are eminent in organizational life. These functions of NVB are relevant for the current research. One of the elementary functions of NVB is to communicate a person's attitude, personality or intentions (Ambady, Bernieri, & Richeson, 2000). Furthermore, NVB functions as a communicator of status (e.g., dominance and submissiveness) to establish and maintain social hierarchical relations (Hall, Coats, & Smith Lebeau, 2005). This function of NVB signifies the importance of NVB in relation with leadership because it impacts the vertical (hierarchical) dimension in the workplace.

In addition, NVB functions also to enhance social functioning (Bonaccio et al., 2016). Bonaccio and colleagues (2016) declare that individuals tend to follow those who display capability, immediacy, and charisma. This could be expressed through NVB, and charismatic leaders exploit the possibility to communicate and express themselves effectively by their NVB (Bass, 1998; Tskhay, Xu, & Rule, 2014). Accompanied charismatic NVB can support and enhance the directive verbal communication of a leader, and intensify the impact by a strong delivery (e.g., by the usage of eye contact and utilization of facial and body expressions).

To persuade the followers, leaders can also make use of immediate NVB. Immediacy is described by Mehrabian (1969) as the degree of closeness with another. Which presumably enhances the relationship between the interaction partners, and in turn could influence the leadership effectiveness. Mehrabian (1969) reports that immediacy generates more liking towards the person who exhibits immediate behavior. Typical immediate NVB is, for instance, leaning

forward and displaying positive facial expressions (Mehrabian, 1969). These behaviors initiate and facilitate smooth and reciprocal interacting patterns with interaction partners (Bernieri & Rosenthal, 1991).

Moreover, another function of NVB is the expression of emotions, which has various social functions (Bonaccio et al., 2016; Keltner & Haidt, 1999). The expressions of emotions by means of NVB facilitates and appropriates the previously mentioned functions, but furthermore, affect people's emotional state and offers information regarding the work atmosphere (Bonaccio et al., 2016). For instance, if the leader displays lowered eyebrows and a closed body posture, with his arms crossed in front of his trunk, this might worry the followers and could tell them there is something wrong. A study of Cole, Walter, and Bruch (2008) regarding expressions of negative nonverbal emotions indicated that the judgement of leadership effectiveness and team performance are significantly negatively influenced by intense expressions of negative emotions. To summarize the functions as described by Bonaccio and colleagues (2016), it can be concluded that individuals express their stature, emotions and characteristics, however not exclusively, by means of their NVB.

In conclusion, expressions of NVB can influence the perception of other individuals. These perceptions are instituted by the disclosure of certain nonverbal cues of the leader. This raises questions regarding what specific cues do contribute to perceptions of effective leadership? The literature regarding these specific nonverbal cues is scarce. Nevertheless, the following section will elaborate on the available studies, with the intention to identify specific NVBs which contributes to effective leadership.

2.2.4 Effective nonverbal leadership behavior

Leaders can use specific nonverbal cues to influence their followers. Previous research showed for instance that nonverbal cues of nodding and gazing towards their followers were evaluated as supportive, which is an element of effective leadership (Remland et al., 1983; Kaiser, Hogan and Craig, 2008). In contradiction, some nonverbal cues (e.g. leaning backward, gazing away from the followers, and remaining their distance towards the followers) were labeled as non-supportive, which is detrimental for effective leadership (Remland et al., 1983; Kaiser, Hogan and Craig, 2008). A more recent study indicated that the appeal or revulsion towards a leader is affected by the hand gestures a leader displays while speaking (Talley, 2012). Leaders which showed

positive hand gestures (open hand gestures, e.g. steepling hands) were rated as more attractive than leaders who exhibited defensive hand gestures (closed hand gestures, e.g. hands in their pocket, folded arms) (Talley, 2012). Hence, it can be concluded that the NVB of a leader influences the leadership effectiveness, supposedly by means of a mutual process between the leader's expressions of NVB and the perception of the follower based upon this behavior (Darioly & Schmid Mast, 2014).

2.3 Current Research and Hypotheses

In the current research, we investigate various specific NVBs and their impact on perceived leadership effectiveness of experts and followers. We examined leaders in a regular staff meeting and registered their NVBs. The scope of the current research concerns the body language of the leaders, which excludes the paralinguistic phenomena of NVB (e.g., speech rate and intonation). We intended to develop an international coding scheme, which could be used in other parts of the world. Therefore, we excluded the paralinguistic aspect of NVB. The literature was consulted to decide what specific NVBs should include and examined in relation to leadership effectiveness. Individuals continuously exhibit nonverbal signals through different channels, and these NVBs are classified in a typology of cues (Ambady & Rosenthal, 1998; Bonaccio et al., 2016). The prevalence of classifications regarding NVBs in the literature is abundant (e.g., Ekman & Friesen, 1969). Knapp, Hall, and Horgan (2014) define the major areas of NVB as follows; (1) posture, (2) gestures, (3) facial expressions, (4) touching behavior, (5) eye behavior. The cues originating from these channels are all related to leadership effectiveness (e.g., Carney, Cuddy, & Yap, 2010; Talley & Temple, 2015; Darioly & Schmid Mast, 2014).

Therefore, the current study will examine the cues of these channels. Based on the literature, we expect that some cues originating of these channels have an impact on perceived leadership effectiveness. Figure 2 presents a graphical representations of the hypotheses. Subsequently, these hypotheses will be discussed in the following section.

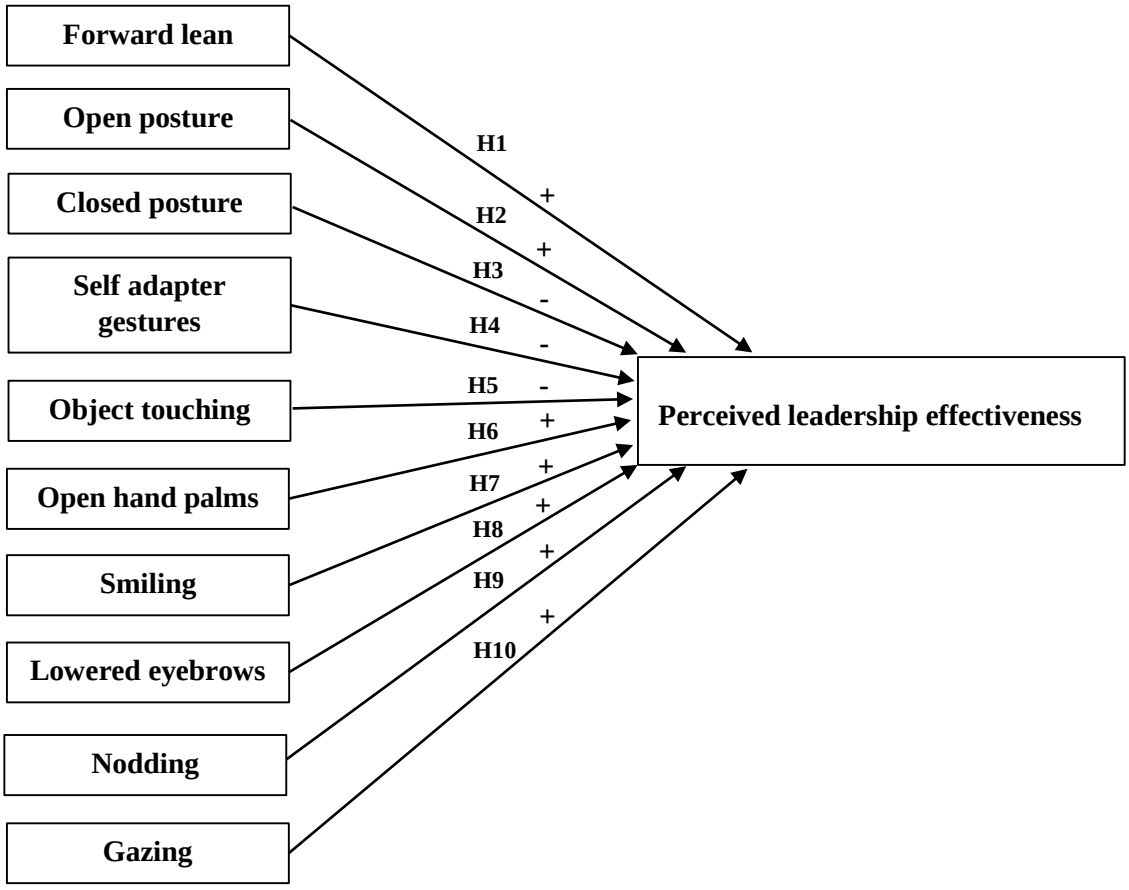

Figure 2 - Hypotheses model

2.3.1 Body

Previous research regarding posture was often in association with involvement and attention. For example, leaning forwards is related to high involvement (Knapp et al., 2014). The literature distinguishes the openness of the body and the direction towards the body leans (Carney, Cuddy, & Yap, 2010; Mehrabian, 1969; Carney, Hall, & LeBeau, 2005). The literature hints that both of these aspects of the body channel are related to leadership effectiveness. Hence, both sections are integrated into the coding scheme and examined in this research.

2.3.1.1 Body lean

Anderson and Anderson (2005) state that leaning forward expresses attention and endorses communication. Moreover, forward lean is one of the behaviors which communicates immediacy (Anderson & Anderson, 2005). Various studies stress the influence of forward leans

in the construct of immediacy (Burgoon, Olney, & Coker, 1987; Solomon & Theiss, 2013). In contrast, leaning backward exhibits insignificant expression of immediacy and could be perceived as a negative response (Solomon & Theiss, 2013; Roussel, 2013). Furthermore, leaning forwards is positively associated with expression of leadership and perception of leadership (Darioly & Schmid Mast, 2014). Hence, hypothesis 1:

H1: More forward leaning behavior of the leader is positively related to perceived leadership effectiveness.

2.3.1.1 Body openness

Machotka (1965) proposed that a more open (expansive) posture emanates a more positive impression. Various stances, varying in postural openness (e.g., very open position / closed arms in front of the trunk position), were presented to participants who judged the visuals. The visuals containing closed-arm stances were rated as rejecting, passive and cold (Machotka, 1965). Such a closed posture is associated with low social power (Carney et al., 2005). In contrary, an open and expansive stance is used to express power (Carney et al., 2010). Regarding the leadership effectiveness context, Darioly and Schmid Mast (2014) state that an open posture is positively associated with expression of leadership and perception of leadership. Hence, hypotheses 2 and 3:

H2: More open posture by the leader is positively related to perceived leadership effectiveness
H3: More closed posture by the leader is negatively related to perceived leadership effectiveness

2.3.2 Hand gestures

The literature distinguishes multiple classifications of gestures (e.g., Kendon, 2004; Mandal, 2014; Knapp et al., 2014). An example of differentiation can be made in relation to the speech context, some hand gestures are linked to the verbal utterance, and some hand gestures are not linked to verbal utterance (Maricchiolo, Bonaiuto, & Gnisci, 2011). However, numerous scholars (e.g., Poggi & Vincze, 2008; Talley & Temple, 2015) directed their studies to the direction and position of the hand palms. In addition, a lot of other researchers are orientated towards the domain of adopters (touching behavior) (Kendon, 2004). Moreover, some scholars indicate a

linkage between these domains and leadership (Darioly & Schmid Mast, 2014). Therefore these domains will be examined and adopted in the coding scheme.

2.3.2.1 Adapters

Adapters are gestures which are detached from the speech context and involves touching behavior (Mandal, 2014). Frequently, the adopter gestures are differentiated in three groups; (1) self-adaptors, (2) object adaptors and (3) haptics (touching other people). Adapters can display various emotions, for instance, a nervous individual could express his emotional state by playing with an object like a pen or continuously knead his or her hands (Siegman & Feldstein, 2014). Self-adaptors are associated with individuals who experience negative emotions (e.g., fear, tension), particularly in the professional setting (Mandal, 2014). Hall and colleagues (2001) researched the relation between self-adapters and leaders, and they found that followers expect that leaders show less self-adaptors than the subordinates.

In relation to effective leadership, Bailey & Kelly (2015) conducted a more recent research. They showed twenty-three undergraduates pictures of individuals in various poses. They concluded that that poses which included including self-adaptors were judged as incompetent and submissive. Furthermore, object adaptors are likewise related to perceptions of nervousness and tension, and even deception (Henningsen, Valde, & Davies, 2005). In contrary, touching someone else is associated with immediacy (Siegman & Feldstein, 2014). Hence, hypotheses 5 and 6:

H4: More self-adaptor gestures by the leader is negatively related to perceived leadership effectiveness
H5: More object touching by the leader is negatively related to perceived leadership effectiveness

2.3.2.2 Hand palms/gestures

The literature differentiates gestures carried out with open palms (the palms are visible) and closed palms (the palms are not visible) (Kendon, 2004). The position of the hand palms displays information regarding the openness and confidence of the individual (Kendon, 2004). Furthermore, the position of the hands influence perceptions of immediacy (Talley & Temple, 2015). Open gestures (with the arms open) are related to competence and dominance (Cuddy, Glick, & Beninger, 2011; Cashdan, 1998). Poggi and Vincze (2008) state that gestures performed

with open palms are more persuasive, important for effective leadership because it exerts and increases the influence on the followers (Burgoon, Birk, & Pfau, 1990) Whereas closed or hidden palms convey distance or a defensive attitude (Kendon, 2004; Talley, 2012). The literature lacks studies with a direct relation between hand palms direction and effective leadership. Hence, hypothesis 6:

H6: More open hand palms by the leader is positively related to perceived leadership effectiveness

2.3.3 Facial expressions

Facial expressions can express numerous expressions. Various researchers studied the expressions of the face, and these studies were frequently focuses on the muscles of the eyebrows, eyelids, mouth and cheeks (Carroll and Russell, 1997). Ekman and Friesen (1978) published the Facial Action Coding System (FACS), one of the best-known measure instruments of facial expressions, which can be considered as a coding scheme to register the muscle movements in the face. FACS is a coding scheme of considerable size, mainly focused on the muscles of the mouth and eyes (Cohn, Ambadar, & Ekman, 2007). The nonverbal cues originating from these focus groups will be examined in the current study.

2.3.3.1 Smiling

Previous research showed different reason regarding the meaning of smiles. Landis (1926) concluded that smiling is a facial expression without meaning. He came to this conclusion because his subjects displayed smiles when they were exposed to both pleasant and unpleasant stimuli. More recent researchers concluded that a smile could have different meanings. Ekman (1992) described 18 different smiles with each an explicit social meaning and Ekman specifies that there are over 50 different smiles which can be distinguished. Individuals that smile are evaluated as more intelligence, warm and likable than non-smiling individuals. However, smiling individuals are also perceived as lower in dominance (Keating et al., 1981; Edinger, & Patterson, 1983). Related to the leadership context, Otta and colleagues (1994) studied the relationship between smiles and leadership. They concluded that the display of a broad smile has a positive impact on the perception of leadership. Hence, hypothesis 7:

H7: More smiling by the leader is positively related to perceived leadership effectiveness

2.3.3.2 Eyebrow

Different positions of the brows are associated with divergent emotions and feelings. Hall, Coas and Smith LeBeau's (2005) marked raised eyebrows as an indicator of power and dominance. Raised eyebrows are associated with expressions of surprise (Knapp et al., 2014) and warmth (Papp, 2012). Lowered eyebrows or "frowning" (Hofmann, 2014) are linked to affective experiences of fear and anger (Valstar, Pantic, Ambadar, & Cohn, 2006), and are associated with displays of pain (Williams, 2002) and confusion (Cunningham, Kleiner, Bülthoff, & Wallraven, 2004). Furthermore, lowered eyebrows are negatively perceived, for example as maliciousness (Hofmann, 2014; Ruch, Hofmann, & Platt, 2013). However, Keating, Mazur, and Segall (1977) found that lowered eyebrows are associated with perceptions of dominance. Moreover, Trichas and Schyns (2012) showed participants pictures with raised and lowered eyebrows and concluded that lowered eyebrows were positively associated with the perception of leadership, despite being perceived as somewhat hostile. Hence, hypothesis 8:

H8: More lowered eyebrows by the leader is positively related to perceived leadership effectiveness

2.3.4 Head Movements

The literature of head movements is scarce compared with the number of studies on gestures and facial expressions (Heylen, 2006). Especially regarding the interpretation of other head movements than nods and shakes (e.g. jerk). The available literature generally originates from scholars in the communication domain, who underlined the role of nodding and shaking in the process of feedback (Navarretta & Paggio, 2010). Cerrato (2007) found that 70% of the expressed nods were related to feedback. Leaders can send signals of appreciation, supportiveness or disapproval by shaking or nodding their head (Paggio & Navarretta, 2011). Moreover, nodding expresses signals of interest (Roter & Kinmonth, 2010). Darioly and Schmid Mast (2014) signify that nodding is positively associated with the perception of leadership. Hence, hypothesis 9:

H9: More nodding by the leader is positively related to perceived leadership effectiveness

2.3.5 Visual Attention

Visual attention, by gazing towards someone, signifies that the "gazer" is paying attention to the other person (Montague & Asan, 2014). Visual attention is often studied in relation with visual dominance. Dovidio and Ellyson (1982) found that individuals who look towards their interlocutor were perceived as more dominant than individuals who looked away from their interlocutor. Another study exhibited the relation between the gazing towards the patients of a physician and the evaluation of patient satisfaction and found that a more gazing towards the patients is associated with higher patient satisfaction (Bensing, 1991). In relation to leadership effectiveness, gazing towards followers is positively associated with the perception of leadership and the expression of leadership (Darioly & Schmid Mast, 2014). Hence, hypothesis 10:

H10: More gazing towards followers by their leader is positively related to perceived leadership effectiveness

CHAPTER 3: METHOD

3.1 Research Design

This study has a cross-sectional design, with three different data sources: (1) an expert rating of leadership effectiveness, (2) a survey measuring followers' perceptions of leadership effectiveness, (3) a systematic video-based coding to quantify the leaders' NVB during regular staff meetings. On using this variety of methods and sources, common method bias as well as common source bias was not a great threat in this study (Podsakoff, MacKenzie, & Podsakoff, 2012). This study's outcome criteria is leader effectiveness; which is used in most meta-analyses and effective leadership studies (De Rue et al., 2011; Dumdum, Lowe, & Avolio, 2002; Seltzer & Bass, 1990).

3.2 Sample

The sample consisted of 40 leaders who work in a Dutch public-service organization, which is active on a national level. The 32 males and 7 females[2] were on average 50.4 years of age (ranging from 27 to 64: *SD* = 8.7), with a job tenure averaging 22.7 years (*SD* = 15.0). We video-recorded their behaviors, during a randomly chosen periodic meeting with their followers, after which the attending followers were asked to fill out a survey. This follower subsample consisted of 425 followers: 273 males and 118 females[3]. Their average age was 49.5 years (*SD* = 9.9); their team tenure averaged 25.2 years (*SD* = 13.5).

3.3 Stimulus Selection

This study analyzes videos of staff meetings of 40 permanent work teams. The 40 leaders were video recorded during a randomly selected, regular staff meeting (Perkins, 2009; Romano & Nunamaker, 2001; Rogelberg, et al., 2010). Before each meeting the camera was placed at a fixed position in the room and directed at the leader; it became quickly a "normal" part of the background (Erickson, 1992; Foster & Cone, 1980). Because the current study is focused on the leader's behavior, the video content exposes the front view of the leader, which provides a clear vision of the leader in the middle of the frame.

[2] One leader did not fill in the demographical questions
[3] 34 followers did not fill in the demographical questions

In order to control for reactivity assumptions, the followers were asked directly after the meetings to offer their views on the behavior of the leader: "to what extent do you find the behavior of your leader during the videotaped meeting to be representative in comparison with non-videotaped meetings?" The response category ranges from 1 *(not representative)* to 7 *(highly representative).* The average score was 5.8 (*SD* = 1.0), indicating that the leader's' behaviors were representative.

The current study works with a selected sub-sample (40 leaders) originating from the total sample (109 leaders), gathered and origination from a Dutch public-service organization. These 40 videos were selected based upon the video quality and observability of the nonverbal cues of the leader. This approach ensures the selection of suited videos to code the behaviors of leaders and averts ambiguity during the coding process.

These 40 videos are selected out of a group of 109 video and selected based on 5 criteria by researcher 1 (HD): (1) visibility of the gesture cues, (2) visibility of the head movement cues, (3) visibility of the facial expression cues, (4) visibility of the gaze orientation cues and (5) the visibility of the posture cues. These five criteria were judged and divided into three categories: (1) all cues are visible, (2) almost all cues are visible and (3) insufficient. In Appendix G all judgements are displayed. A summarized representation is presented in the table below:

Table 1 - Stimulus selection

N = 109	All cues are visible	Almost all cues are visible	Insufficient
Gesture cues	75	12	22
Head movement cues	104	2	3
Facial expression cues	41	30	38
Gaze orientation cues	81	19	9
Posture cues	103	1	5

There are several reasons why a video did not meet the requirements and therefore placed in the category "Insufficient''. As shown above, the facial expression cues are the most frequent insufficient visible. Of the 38 times, this is 23 times (60,5%) caused by an unsharp video/too low resolution, nine times (23,7%) due to the angle of the camera position, two times (5,3%) due to an object in the view, one time (2,6%) due to the fact that the leader is not always in the view of the

camera, one time (2,6%) due to eyeglasses and two times (5,3%) there is no video available of the leader. For a complete overview of the reasons for insufficient judgement, see Appendix I. An evaluation of these reasons could improve future data collection.

Based on this evaluation a short list was constructed by researcher 1 (HD). The 109 teams were assigned into three categories; (1) usable, (2) potential usable and (3) unusable. Researcher 2 (JS) made the final selection of 40 tapes based on the short list.

From each of the 40 videos, three slices were selected of ten seconds (N=120), according the thin slices methodology. For more information regarding the thin slices methodology, see Appendix C. The selected slices display exclusively fragments during the meeting, implying that coffee breaks are not part of the selected slices. The three thin slices were derived by researcher 2 (JS) at standardized time-points in the meeting, approximately at one-quarter, and at three-quarter of the meeting. The verbal behavior in the clips might also influence the observers, and therefore the verbal expressions were equalized. In addition, an important condition of an accurate judgement is that the evaluated context is relevant for the judgement (Ambady & Rosenthal, 1993). During staff meetings leaders alternate between listening and speaking behaviors and therefore one fragment only contains uninterrupted listening behavior, and the other two slices incorporate 10 seconds of the speaking behavior of the leader.

To systematically code the NVB of the leaders appearing in these thin slices, a detailed behavioral observation manual was used, designed and developed based on previous studies for field settings. The following section will provide a description of the development of the coding scheme and coding procedures.

3.4 Development and Refinement of the Nonverbal Coding Manual

Even though there already exist various coding manuals designed to capture NVB, none were found suitable to the managerial field context of interest: especially for manager-led, regularly occurring staff meetings within public sector organizations. Hence, a new nonverbal coding scheme was developed.

The coding scheme and the conceptual and operational definitions for the selected NVBs were adapted from prior research as well from previously validated coding schemes such as the MUMIN multimodal annotation scheme (Allwood, 2007), the Body Action and Posture Coding System (Dael, Mortillaro, & Scherer, 2012) and Facial Action Coding System (Ekman & Friesen,

1978). By adapting existing coding manuals and taking into account this study's specific research questions, participants, and context, the scheme ensures that the nonverbal categories of interest were both observable and codable with the already recorded video data. The coding scheme is focused on nonverbal communication areas as described by Ambady and Rosenthal (1998): (1) the face, (2) the body and (3) arms (and hands). The resulting coding scheme intends to reliably capture micro behavior by minimizing the impact of human judgements and personal scores. The coding scheme is therefore physically based, instead of socially constructed (Chorney, McMurty, Chamber, & Bakeman, 2015). Table 2 (page 29) presents a summary of the final version of the coding scheme, which is used in the coding process. Appendix J displays the full coding scheme.

The development of the coding scheme was guided by the four major steps of behavioral coding scheme development as proposed in Chorney, McMurtry, Chamber and Bakeman (2015). The steps are: (1) refine the research question, (2) develop the coding manual, (3) pilot the coding manual, and (4) implement the coding scheme. This approach is considered suitable for research where "direct observation of human behavior is of interest" (Chorney et al., 2015, p. 162).

The main researcher developed the first list of codes; then, their operational definitions were composed based upon literature. Furthermore, codes were added and/or dropped based on occurrence and significance of these behaviors in the target data set. Papers and yet existing coding schemes were examined and modified to compose a first draft (e.g. Allwood et al., 2007; Mehrabian, 1972; Burgoon, Schuetzler, & Wilson, 2015).

Before becoming the final version, the content of the coding scheme is continuous refined. The process of redefinition started off by brainstorm sessions with coding schemes experts. These coding scheme experts are researchers with experience in the development and usage of coding schemes (e.g., Van der Weide & Wilderom, 2004). During these sessions, the initial codes and operating definitions were discussed with specialists in the area of coding scheme development. Consulting these experts resulted in a simplified version of the coding scheme.

In addition, researcher 2 (JS) organized brainstorm and writing sessions, together with colleague researchers (GR & HD) and watched small samples of other observational data (which is not utilized thereafter in the main study) and adjusted the coding scheme accordingly. These adjustments resulted in enriched operational definitions, examples and in the coding scheme as well as the inclusion of clarifying visuals before the start of the coding pilot.

Table 2 - Coding Scheme

Channel	Category	Behavior	Source	Description
Body	Openness	*Open (expansive) posture*	Carney, Cuddy, & Yap, 2010; Hall, Coats, & LeBeau, 2005	Spreading out of one's limbs.
		Closed (constricted) posture		Constriction of one's limbs so that limbs are in contact with trunk
		Defensive (arms crossed) posture		Arms are in contact with trunk and crossed in front of the chest in defensive position
	Lean	*Forward lean*	Dael, Mortillaro, & Scherer, 2012; Mehrabian, 1972	Body moving or leaning forwards
		Backward lean		Body moving or leaning backwards
		Middle position		Body moving or leaning towards a middle (neutral) position.
Gestures	Adaptors	*Hand self-touch*	Kane, Maguire, Neuendorf, & Skalski, 2009 ; Maricchiolo, Livi, Bonaiuto, & Gnisci, 2011; Ramseyer & Tschacher, 2014; Mahmoud, Baltrušaitis, & Robinson, 2014; Dael, Mortillaro, & Scherer, 2012	One or both hands manipulate a part of one's own hands.
		Face self-touch		One or both hands manipulate a part of one's own face.
		Body self-touch		One or both hands manipulate a part of one's own body.
		Static hand touch		Fingers interlock or touch in a resting position.
		Object touch		One hand or both hands manipulate objects in the physical space.
		Person touch		One or both hands are used to physically touch another person.
	Speech linked	*Palms open*	Kendon, 2004; Martell, 2005	Palms of one or both hands are visible during speech.

		Palms closed		Palms of both hands are not visible during speech.
		Palms neutral		Palms pointing to each other, not up or down
		Hands not visible		Hands are not visible during speech
Eyes	Gazing	*Gazing towards (group of) followers*	Carney, Hall & Smith Lebeau, 2005; Montague, Xu, Asan, Chen, Chewning, & Barrett, 2011	Looking towards the group or individual followers
		Gazing away from (group of) followers		Looking away from the group or individual followers
		Functional gaze		Looking at work-related materials or objects in the room with the intent to use them
Face	Mouth	*Closed smile*	Otta, Delevati, Cesar & Pires, 1994; Cohn & Ekman, 2005	The mouth corners are slightly drawn up and outwards, while the teeth remain covered by the lips.
		Upper smile		The mouth corners are drawn up and out, and the upper lip is raised showing part of the upper teeth while the lower teeth remain covered by the lips
		Broad smile		Broad or wide smiles where the upper and lower teeth are exposed
		Lip corners down		The mouth corners are lowered down
	Eyebrows	*Raised eyebrows*	Carney, Hall, & Smith Lebeau, 2005	One or two eyebrows are lifted upward.
		Lowered eyebrows		Code when one or both eyebrows contract and move towards the nose.
Head	Head movements	*Nod*		One vertical up-and- down or down-and- up movement of the head.

Shake	Allwood, Cerrato, Jokinen, Navarretta, & Paggio, 2005; Allwood, Cerrato, Jokinen, Navarretta, & Paggio, 2007	One horizontal turning movement of the head from one side to the other.
Sideward tilt		Head tilts sideways diagonally so that it leans to the left or right side
Moving head forwards		Forward movement of the head
Moving head up and-backwards (quick)		Exaggerated quick movement of the head tilting backwards and up
Moving head up and-backwards (slow)		Exaggerated slow movement of the head tilting backwards and up

3.5 Coding Procedure

Nonverbal signals are continuously sent out through different channels (Ambady & Rostenhal, 1998). For example, a person is able to smile and nod their head concurrently. Hence, the nonverbal channels of interest can co-occur at any given point in time. However, the individual nonverbal cues within each of the main channels are mutually-exclusive. For example, within the smiling category, each of the types of smiles cannot co-occur; one cannot by definition display both a broad smile and a closed smile. To facilitate accurate coding of all behaviors, the pilot coding was conducted in three rounds. The groupings per round were chosen in such a way so that the coders did not have to divide their attention to antonymous nonverbal communication channels (e.g. coding the body and facial channels simultaneously), which could hamper the coding process and decrease coding accuracy. Behavioral groups which are simultaneously coded: (1) head movements and facial expressions, (2) body posture and hand gestures, and (3) visual attention.

In the pilot, each video was systematically and meticulously analyzed by two independent coders, based on the developed coding scheme, while using specialized video-observation software from Noldus Information Technologies "The Observer XT" (Noldus, Trienes, Hendriksen, Jansen, & Jansen, 2000; Spiers, 2004). All behaviors are registered through the timed-event sequential continuous coding method (Chorney et al., 2015). This implies that all coded behaviors are placed in chronological order and the precise time of the behavior is registered. Furthermore, the sound was stripped from the stimulus material before the coding process. This was done in order to help coders focus on the NVB without being distracted or influenced them by the verbal utterances. In addition, the coding scheme was designed in such a way that knowledge of the language of the target sample is not needed, hence the nationality of the coders did not matter.

The two coders, Dutch female graduate students with research assistant positions, were on average 23 year of age (ranging from 22 to 24: SD= 1.41) with a background in Health Sciences and Communication. Both coders were blind for the hypotheses and did not know the leadership effectiveness scores of the leaders in the videos. The coders received instructions and training from researcher 1 (HD), researcher 2 (JS) and a third research assistant (GR). The two main coders (RK and DW) had not been involved in the development of the coding scheme and were also schooled in the Noldus Observer XT software before examining the coding scheme. Furthermore, the coders were informed, in advance of any coding activity, regarding the protocols during the coding

process (e.g. coding of the videos may only be performed independently, in our lab environment which is specifically designed to optimize the coding performance. They had to read the coding scheme before every coding session, and after every half hour of coding they had to take a break. Moreover, they were supposed to report in case they recognized one of the leaders from their private lives. Furthermore, they received instruction regarding working with this confidential data.

Every round of coding was preceding by an introduction meeting with at least one of the researchers regarding the codes and operating definitions of the relevant coding scheme categories and an opportunity for coders to ask questions. Training started with 20 randomly selected clips (these practices tapes were not part of the study data, and were selected by the main researcher) to practice. Coders often used the possibility to replay certain sections to be able to code all the behaviors. After every first coding session of a behavioral group, the coders and other researchers discussed the disagreements. These discussions resulted in consensus regarding coding definitions, and accordingly, the operational definitions were defined more clearly, and examples were added to the coding scheme for clarifications.

The Observer XT software incorporates inter-rater reliability measures which were continuously monitored during the coding process. This was done in order to obtain and measure the agreement between the two coders. These indicators were used to assess the supposedly increasing degree of agreement between the two coders. For agreement, an interval of two seconds margin was used. In the case of insufficient interrater reliability, the training sessions continued with randomly selected clips which were not part of the data sample, until the coders reached an agreement of .6 kappa or higher. Especially during the coding of the head movements, the coders experienced difficulties, which resulted in extensive additional training sessions and coding scheme adjustments so that the interrater reliability improved.

After enriching the coding scheme and reaching the inter-rater reliability threshold of .6 kappa, a randomly selected sample of 25% of the study data (i.e., validation tape) was coded to obtain the agreement and thereby the reliability and validity of the coding scheme. This procedure was similar to the proposed method of Chorney and colleagues (2015). The sample was selected by researcher 1 (HD) and the coders were unaware and unfamiliar with the content. Afterward, the coders discussed their differences and created one tape with the coding's they agreed on (i.e., golden tape). In case of an unsolvable disagreement or ambiguous situation, it was discussed with the researchers.

The process to assess the inter-rater reliability is important to define the credibility and usability of the coding scheme and the eventual data. Agreement between coders concerning coded video content indicates although it does not assure, reliability and reliable data (Joyce, 2013). Krippendorff (2004, p. 413), an expert on inter-rater reliability (Joyce, 2013), describes it as "agreement is what we measure; reliability is what we wish to infer from it". There are various measures to quantify the inter-rater reliability, each with its own strengths and weaknesses. Regarding the reliability of this study, several measures are used, and in the following section, these measures will be discussed.

3.6 Validation of the Coding Scheme: Measures of Agreement

Percentage of agreement describes the proportion of codings on which the coders reached an agreement, where 100% represents complete agreement, and 0% represent entirely disagreements between the coders (Hayes & Krippendorff, 2007). This percentage of agreement does not correct for the change of random agreements, which could cause a magnification of the true agreement between the coders (McHugh, 2012). Furthermore, in case the agreement is calculated over multiple codings into one variable, the percentage of agreement might conceal hidden disagreements. This situation allows inaccurate coding categories to hide behind reliable categories (Krippendorff, 2004; Joyce, 2013). Despite all these limitations, it is often used because it is straightforward to interpret and simple to calculate (Fosnight & Fowler, 1996; Joyce, 2013). Hence, this statistic will be reported alongside several other IRR indices that due account for agreement expected by chance. Due to these limitations, percentage of agreement will not be used as a primary indicator of interrater reliability.

In order to assess the interrater agreements, kappa statistics are extensively used (Dael et al., 2012; Cavicchio & Poesio, 2009). Kappa (κ) corrects for the random chance of agreement and is therefore favored relative to the percentage of agreement (Carletta, 1996). However, this coefficient is especially suited as a reliability measure in the case of a mutually exclusive coding scheme (Cavicchio & Poesio, 2009). Furthermore, in this study the behaviors were coded on a continuous timeline, which signifies that the behaviors could occur almost at any moment (Hailpern, Karahalios, Halle, Dethorne, & Coletto, 2009). Therefore, the likelihood of an agreement based on chance is highly exceptional, which raises questions regarding the appropriateness of the use of Cohen's Kappa (Kazdin, 1982). Given the limitations of the

percentage agreement and Kappa, we include Krippendorff alpha as our main indices of inter-rater reliability.

To measure the interrater reliability also Cramer's v and Spearman rho's were also calculated. According to Krippendorf (2004) and Joyce (2013), Krippendorff's alpha (α) is a more reliable measure than Kappa and percentage of agreement. However, the computability and theoretical foundation are more complex, and the conception of the α score is occasionally even harder to interpret than kappa (Joyce, 2013; Cavicchio & Poesio, 2009). Krippendorff's alpha, in contrast with the percentage of agreement and kappa, takes the complete distribution of coding's over the categories into account and is calculated based upon the observed and expected disagreements (Joyce, 2013; Cavicchio & Poesio, 2009). In addition, Krippendorff's alpha is suited for all levels of measurements or metrics, works with any number of coders, incomplete data, and does not oblige a minimum sample size (Krippendorff, 2011). Since 2000, the usage of Krippendorff's has been increased, e.g. it is used as reliability measure in the multimodal corpus of Reidsma, Heylen and Op den Akker (2009), Kang, Gratch, Sidner, Artstein, Huang and Morency (2012) and Mahmoud, Baltrusaitis, and Robinson (2014).

Cramer's V is a measure which calibrates the association of two categorical variables, which is popular to measure the association between nominal variables (Field, 2013; White & Korotayev, 2003; Bergsma, 2013). The measure is closely related to the chi-square statistic, although it includes the sample size into its calculation (Field, 2013; Bergsma, 2013). The bias containing in Cramer's V output, particular in small samples, could complicate the interpretation (Bergsma, 2013), though, because of the limited sample size, Cramer's V will not be used as the primary indicator of inter-rater reliability.

Field (2013, p. 82) describes Pearson rho, *r*, as a measure of the strength of the relationship between two variables''. The value of *r* lies between -1 and +1, depending on the nature of the relationship (Field, 2013). Rho is used as a consistency measure and is in essence not a measure of consensus; it is used to obtain the consistency of the raters or coders in their judgements (Stemler, 2004; Albano, 2017). A high correlation score can be achieved by a systematic mismatch in the codings (e.g. every time coder 1 (RK) codes a nod and coder 2 (DW) codes a shake). In the previous example, the coders never agreed on their codings but are consistent in their codings and disagreement, which will result in a high correlation score (Albano, 2017). Furthermore, the application of correlation measures (e.g., rho) might give a deficient impression of the agreement

between coders because they tend to overstate or understate the true extent of agreement (McHugh, 2012; Stemler, 2004). Therefore, Rho will not be used as a primary indicator of inter-rater reliability.

After the validation of the coding scheme, the coders started to code the complete sample. Coders independently coded the data. After independent coding the entire data, the coders convened to discuss their disagreements. Most of their disagreements were solved by the process of consensus. Disagreements for which the coders did not reach consensus were solved by the main researcher. These final codings were used for further analyses.

After the coders were finished with the entire process, the pre-consensus event logs were exported to Excel. The event logs were checked on errors and adjusted manually in Excel before being inserted in SPSS. In SPSS the described inter-rater reliabilities measures were calculated, which are displayed in Table 3 and 4.

Table 3 – Inter-rater reliability validation tape[4]

Column1	Agreement / disagreement	Percentage of agreement	Krippendorff's alpha (α)	Kappa (κ)	Rho (*r*)	Cramer's V
Brow behavior	22/3	88.0%	0.82	0.81	0.96	0.92
Gazing	75/6	92.6%	0.85	0.85	0.82	0.87
Gestures palms	35/11	76.1%	0.67	0.66	0.69	0.63
Gestures touch	46/16	74.2%	0.71	0.71	0.87	0.86
Head movements	37/34	52.2%	0.34	0.35	0.58	0.63
Posture lean	27/13	67.5%	0.45	0.45	0.50	0.53
Posture openness	25/9	73.5%	0.55	0.54	0.74	0.68
Smiling	26/5	83.9%	0.76	0.77	0.71	0.86
Speech	43/7	86.0%	0.72	0.72	0.74	0.74

[4] Gazing, speech and postural openness are continuous coded (during the fragment was always one of the behaviors of these categories coded). Brow behavior, gestures palms, gestures touch, head movements, postural lean and smiling were not continuous coded, therefore were the gaps between the behaviors also considered in this reliability analysis.

Table 4 – Inter-rater reliability all data

	Agreement / disagreement	Percentage of agreement	Krippendorff's alpha (α)	Kappa (κ)	Rho (*r*)	Cramer's V
Brow behavior	117/34	87.3%	0.77	0.77	0.76	0.69
Gazing	296/47	86.3%	0.74	0.74	0.78	0.65
Gestures palms	245/50	83.1%	0.75	0.74	0.87	0.70
Gestures touch	170/32	84.2%	0.79	0.79	0.78	0.76
Head movements	206/158	56.6%	0.35	0.35	0.03	0.56
Posture lean	103/22	82.4%	0.63	0.62	0.48	0.58
Posture openness	108/13	89.3%	0.80	0.80	0.70	0.68
Smiling	106/14	88.3%	0.80	0.80	0.83	0.75
Speech	150/169	88.8%	0.77	0.77	0.72	0.80

The interrater reliability scores (calculated in Krippendorff's alpha) in the validation tape, besides head movements and postural lean, range between .85 and .55 α. These scores can be considered as sufficient reliable (Antoine, Villaneau, & Lefeuvre, 2014). The relatively low agreement score on postural lean (.45α/67,5%) is possible due to the camera position used during the coding process. This camera angle was in front of the leader which allowed the coders to optimal code the other categories, but gave a one-dimensional angle concerning the postural lean of the leader. Furthermore, the low agreement regarding the head movements (.34α/52,1%) category was due to the sensitivity of the coders. Some of the leaders were very dynamic and energetic, which led to the ambiguous interpretation of the head movements of the leaders. Because the difference in sensitivity, these head movements were interpreted different by the coders. In addition, low agreement scores regarding the head movements is not a rare occurrence, other existing coding schemes also report low agreement scores regarding this category (e.g. see the MUMIN coding scheme (Allwood et al., 2007)).

The IRR scores for the final data are higher than the validation tape. The gazing and brow behavior categories scores are decreased compared with the validation tape (still sufficient), but the other categories improved. This might be explained by the extra round of coding and consultation after the validation tape to discuss the disagreements. Although, the head movement score (.35α/56,6%) was still insufficient. However, after coding, the coders reviewed and

discussed the disagreements. They made a golden tape in consultation and reached a 97.27% agreement over all the codings. The remaining disagreement (2.73%) were resolved by the primary researcher (JS), which completed the data which is used in this study. A description of all coded behaviors is displayed in Table 5[5].

Table 5 - Descriptive statistics

	Frequency					Duration (in seconds)			
	N	*Minimum*	*Maximum*	*Mean*	*SD*	*Minimum*	*Maximum*	*Mean*	*SD*
Hand self-touch	12/40	1	2	1.33	0.49	1.72	15.64	6.56	4.15
Face self-touch	18/40	1	3	1.28	0.58	0.43	10.44	4.35	3.15
Body self-touch	3/40	1	1	1.00	-	3.40	9.00	6.01	2.82
Static hand touch	17/40	1	4	2.06	0.90	1.60	26.27	10.29	7.00
Object touch	20/40	1	3	1.5	0.69	1.41	24.51	9.21	5.98
Person touch	0/40	0	0	0.00	0.00	-	-	-	-
Lean forward	22/40	1	3	1.64	0.73	0.64	30.44	13.53	7.70
Lean backward	6/40	1	2	1.17	0.41	5.73	20.24	10.85	4.88
Lean middle	38/40	1	4	2.34	0.88	9.52	30.11	21.75	8.17
Lowered eyebrows	7/40	1	3	1.43	0.79	0.20	10.28	3.91	3.27
Raised eyebrows	22/40	1	3	1.64	0.79	0.08	13.23	4.60	4.38
Palms open	15/40	1	2	1.2	0.41	0.44	5.20	2.39	1.77
Palms closed	21/40	1	4	1.43	0.81	0.60	10.23	5.15	2.98
Palms neutral	27/40	1	4	1.70	0.91	0.36	13.52	5.01	3.66
Hands not visible	12/40	1	3	1.67	0.78	5.84	17.68	11.76	3.84
Closed smile	6/40	1	1	1.00	0.00	0.56	3.24	2.07	1.14
Upper smile	16/40	1	2	1.19	0.40	0.46	9.71	3.43	2.45
Broad smile	1/40	1	1	1.00	-	0.52	0.52	0.52	-
Lip corners down	11/40	1	3	1.36	0.67	0.52	10.00	3.91	3.27
Gaze towards followers	40/40	3	9	5.10	1.55	14.88	32.11	24.38	4.58
Gaze away from followers	37/40	1	7	2.89	1.60	0.20	14.51	4.39	3.59
Functional gaze	15/40	1	3	1.53	0.74	0.96	13.56	4.66	3.77
Open posture	38/40	1	3	2.13	0.90	0.68	30.23	20.1	9.57
Closed posture defensive	8/40	1	2	1.13	0.35	4.43	19.37	9.76	4.44
Closed posture other	24/40	1	3	1.63	0.71	2.36	29.48	14.29	7.38
Shake	12/40	1	3	1.58	0.90				

[5] N describes the number of leaders who displayed the behavior, and the minimum, maximum and mean are related to the occurrence of these leaders.

Nod	37/40	1	15	5.92	3.44	
Move backwards up quick	15/40	1	3	1.13	0.52	
Move backwards up slow	10/40	1	2	1.20	0.42	
Sideward tilt	24/40	1	4	1.46	0.88	
Move forward	15/40	1	4	1.53	0.92	
Other head movements	2/40	1	1	1.00	0.00	

3.7 Measures

3.7.1 Leadership effectiveness

Leadership effectiveness is measured by two different groups; (1) experts and (2) followers. The experts were selected in conjunction with a member of the HRM staff and were knowledgeable, at that time, about the functioning of each leader. The followers are the leader's subordinates, which are members of the team of the leader. Within the participating organization, there were 71 experts ratings collected (1 to 3 expert raters per leader, on average 1.8 per team), who independently of each other, gave one effectiveness score per leader. Only raters who were knowledgeable, at that time, about the functioning of each leader were selected to rate the leaders. This selection process was carried out in conjunction with a member of the HRM staff of each organization. Leader effectiveness ratings by experts were rated on a scale of 1 (*highly ineffective*) to 10 (*highly effective*) which is the generic grading scale in the Netherlands. On average, the focal leaders were given a score of 7.2 (ranging from 4.0 to 8.75, SD= 0.86). To obtain and measure the inter-rater reliability of the leadership effectiveness rating, Intraclass Correlation Coefficient (ICC) is applied to the expert scores, ICC1 (.04) and ICC2 (.29) and an average Rwg of .85 (with a range from .23 to 1). The expert's score was aggregated, based on an evaluation of Rwg (which reflects the homogeneity or consensus among the raters) (James, Demaree, & Wolf, 1984).

There were 391 leadership effectiveness scores collected from the followers of the leader (4 to 22 per team, on average 9.5 per team and SD=10.6). This was measured by the four overall effectiveness items that are part of the MLQ-5X-Short package (Avolio & Bass, 1995). A sample item is: "My supervisor is effective in meeting my job-related needs." The response categories range from 1 (*never*) to 7 *(always*). The Cronbach's alpha for this construct is .89. For every follower were these four effectiveness items averaged to a mean score for their leader. On average, the focal leaders were given a score of 5.35 (ranging from 2.75 to 7.00, SD= 0.92). To obtain and

measure the inter-rater reliability of the leadership effectiveness rating, Intraclass Correlation Coefficient (ICC) is applied to the follower's scores, ICC1 (.26) and ICC2 (.79) and an average Rwg of .94. The follower's score were aggregated, based on an evaluation of Rwg (which reflects the homogeneity or consensus among the raters) (James, Demaree, & Wolf, 1984). All ratings were confidentially processed, and not a single person of the concerned organization did have access to the judgements of experts nor followers. Both leadership effectiveness scores of experts and followers are used in this study as dependent variables, as a result of the absence of a significant correlation between the expert and followers scores. The absence of a significant correlation between the experts and followers scores signifies two different perspectives on leadership effectiveness, and could therefore not be composed as one variable.

3.8 Analytical Procedures

To examine if the selected sample is a representation of the complete dataset of 109 teams various inferential statistical analyses were utilized. The most important dependent variables of this study (leadership effectiveness scores by experts and followers) were tested for normality and representativeness. A MANOVA was conducted to measure the differences between the selected leader sample (N=40) and the non-selected leaders (N=73) to compare leadership effectiveness scores of experts, followers, age and years of tenure. Based upon the multivariate analysis (F (4, 104) = ,630, p = .642; Pillai's V = ,024), it can be concluded that there is no significant difference between the selected sample and the non-selected leaders based upon expert leadership scores, followers leadership scores, age and years of tenure. In addition, a chi square was conducted for gender (χ^2 (1) = 1,906, p = .167), which indicates that there is no significant difference between the gender of the leaders in the selected sample compared to the non-selected leaders. Hence, there are no significant differences between the selected sample and the non-selected leaders.

Furthermore, the leadership effectiveness scores were tested for normality. The Shapiro-Wilk normality test displays for expert leadership effectiveness scores (W = 0,968, p-value = 0,321) and for followers leadership effectiveness scores (W = 0,949, p-value = 0,076), which implies that the scores do not significantly differ from a normal distribution (Field, 2013). Hence, they are suited for parametric analysis. Based on aforementioned tests, the sample can be considered a representative reflection of the entire sample.

To check the normality of the coded behaviors, all coded behaviors were subject to a

Shapiro-Wilk test (see Appendix E). Merely two behaviors did not significantly differ from a normal distribution: gaze duration towards followers (W = .961, *p*-value = .181) and nodding (W = 0,953, *p*-value = .093). Ergo, the majority is not normally distributed (Field, 2013). This might be explained by the concise coding time of the behavior (30 seconds). Consequently, not every behavior was coded per leader.

Given the limited number of coding's of several behaviors (see Table 5), a number of composites are constructed; (1) *All smiles* (closed + upper + broad smiles duration), (2) *Closed posture* (closed posture + closed posture defensive duration), (3) *Self-touch* (hand self-touch + face self-touch + body self-touch), (4) *Gaze from followers* (gaze away from followers + functional gaze duration), (5) *Head movements* (all head movements frequencies). These composites will be used as independent variables in the regression analysis (model testing).

To test the assumption of homoscedasticity and independence of the independent variable in linear regression, the independent variables are put in a correlation matrix (Vatcheva, Lee, McCormick, & Rahbar, 2016). A cut-off point of .8 is utilized, and all behavior are correlated less with each other (Vatcheva et al., 2016). Hence, the data is suited for linear regression (Field, 2013).

Correlation and regression analysis were executed between the coded behaviors and the leadership effectiveness scores of both followers and experts. Scores of the experts and followers are used separately in the analysis because they do not correlate in the selected sub-sample. Spearman correlations coefficients were utilized as correlation measure, on account of the non-normal distributed coded data (Field, 2013).We controlled for educational level and age because various studies indicated that those factors might influence a leaders' effectiveness (Bell, Rvanniekerk, and Nel, 2015; Liden, Stilwell, & Ferris, 1996). In all test a significant level of p= <.05 is utilized.

CHAPTER 4: RESULTS

4.1 Correlation

Table 6 displays the partial correlations between the coded behaviors and both leadership effectiveness scores. Only two behaviors are significant correlated with leadership effectiveness scores. Leadership effectiveness rated by followers is significantly negatively correlated with lowered eyebrows: both in terms of frequency (r = .362) and duration (r = .371). With reference to leadership effectiveness, gaze towards followers (duration) emerge to be a significant positive correlation (r = .390). Furthermore, it is notable that all the smiling behaviors are (non-significant) negatively correlated with followers and experts judgements concerning leadership effectiveness.

Table 6 - Spearman-Brown Correlations

	Leadership effectiveness Score followers		Leadership effectiveness Score experts	
	Frequency	Duration	Frequency	Duration
Closed smile	-0.17	-0.17	-0.13	-0.15
Upper smile	-0.02	-0.04	-0.18	-0.28
Broad smile	-0.22	-0.22	-0.26	-0.26
Lip corners down	-0.11	-0.15	0.31	0.31
Palms open	0.19	0.18	0.14	0.11
Palms closed	0.02	0.05	0.18	0.23
Palms neutral	0.05	-0.02	0.01	0.10
Hands not visible	0.11	0.11	0.13	0.14
Hand self-touching	0.01	0.03	-0.11	-0.11
Face self-touching	0.19	0.14	0.12	0.16
Body self-touching	0.15	0.16	-0.07	-0.07
Static hand touching	-0.03	-0.11	-0.04	-0.01
Object touch	-0.27	-0.18	-0.24	-0.26
Lean forward	0.05	0.15	-0.03	0.05
Lean backward	0.08	0.07	-0.03	-0.06
Lean middle	-0.31	-0.25	-0.01	0.04
Lowered eyebrows	-0.36*	-0.37*	-0.17	-0.16
Raised eyebrows	0.07	0.01	0.14	0.12
Functional gaze	-0.04	-0.01	-0.23	-0.31
Gaze towards followers	-0.05	0.14	0.24	0.39*

Gaze away from followers	0.06	-0.12	0.08	-0.05
Open posture	0.10	0.02	0.22	0.18
Closed posture defensive	0.11	0.08	-0.27	-0.27
Closed posture other	-0.06	-0.07	-0.16	-0.14
Shake	-0.16		0.10	
Nod	0.31		0.05	
Move backwards up quick	0.02		-0.16	
Move backwards up slow	-0.10		-0.27	
Sideward tilt	-0.03		-0.12	
Move forward	-0.09		0.01	
Other headmovements	-0.26		0.24	

4.2 Model Testing

The regression analysis indicated two significant behaviors related to leadership effectiveness scores of experts. There were no significant behaviors indicated which are related to leadership effectiveness scores of followers.

Regarding the leadership effectiveness scores of experts, a simple linear regression was calculated to predict leadership effectiveness based on smiling behavior. A significant regression equation (negative) was found ($F(1,38)= 4.133$, $p = .049$), with an R^2 of .098 (β= -.313). Another significant relationship was found to predict leadership effectiveness based on gaze duration towards followers. A significant regression equation (positive) was found ($F(1,38)= 5.480$, $p = .025$), with an R^2 of .129 (β= .359).

Regarding the leadership effectiveness scores of followers, no significant relationship was found. We did not found a significant regression equation between lowered eyebrows and leadership effectiveness, although the Spearman-Brown correlations indicated this relation. Figure 3 displays the relationship between these behaviors and leadership effectiveness rated by experts.

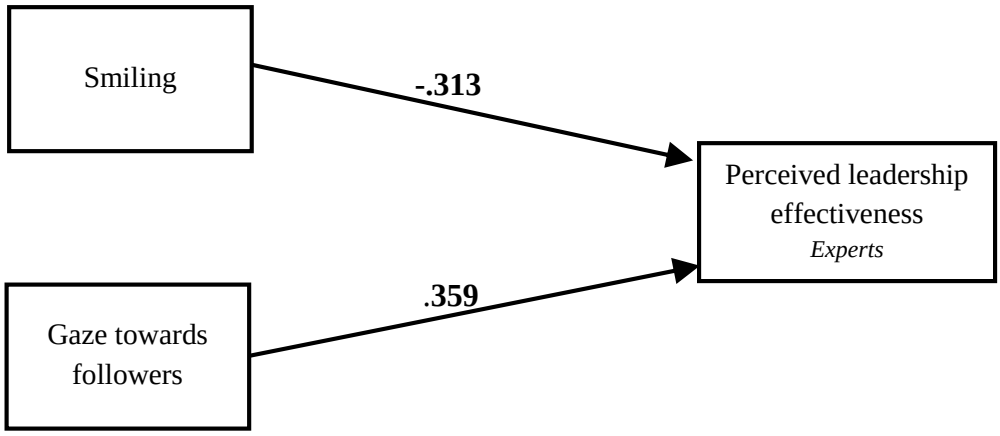

Figure 3 - hypotheses testing

The outcome of the study does only support H10; all the other hypotheses can be rejected. Moreover, the results conclude a reversed effect as proposed in H7. These results indicate that smiling behaviors and gaze duration towards followers are linked to leadership effectiveness perceptions of experts.

CHAPTER 5: DISCUSSION

This thesis presents an empirical study of 40 videotaped middle managers intended to identify specific nonverbal behaviors in meeting settings which impact the perceptions of leadership effectiveness of experts and followers. The study is guided by the research question: **What specific nonverbal behaviors of leaders, displayed during staff meetings, are related to leadership effectiveness as perceived by both their followers and leadership experts?**

The outcome of the study shows that smiling and gazing towards the followers has an impact on expert ratings of leadership effectiveness. These findings have meaningful implications for practitioners (e.g., for educational purposes), which will be discussed in the practical implications. The next section will discuss the significant findings in detail.

The results confirm that leaders who exhibit more (a higher total duration) gazing towards the followers increase the perceptions of leadership effectiveness (of experts), as proposed in H10. These findings are in line with the statements of Darioly and Schmid Mast (2014) who propose that gazing towards followers is an expression of leadership and that it has a positive impact on perceptions of leadership. Gazing towards someone is an indicator of attention, engagement and suggests closeness, whereas the evasion of looking towards an interlocutor could indicate shyness or avoidance (Admoni, Hayes, Feil-Seifer, Ullman and Scassellati, 2013; Baringer & McCroskey, 2000). Gazing towards followers is an immediate behavior intended to signal warmth, availability and an open attitude (Andersen, 1999; Burgoon, Manusov, Mineo, & Hale 1985). Burgoon and colleagues (1985) found that gazing and eye contact are related to positive perceptions, which is in line with the above-described findings and the results of this study. Furthermore, gazing towards the interlocutors communicates confidence, and longer gazing is associated with power, whereas the avoidance of looking towards followers is associated with insecurity and low power individuals (Griffin & Bone, 2016; Hall et al., 2005). Moreover, as follow-up of the current study, we administered a study wherein we explored the relation between specific nonverbal leader behavior in relation with leadership effectiveness and warmth & power perceptions. For the complete study, see Appendix A.

Furthermore, the results indicate that increased smiling has a negative effect on the perceptions of leadership effectiveness of experts, which is in contrary with the expected hypothesis as proposed in H7. Smiles are often seen as a sign of enjoyment, and it can represent sincere amusement or happiness (Ekman, Davidson, & Friesen, 1990). Various studies indicate

that smiling individuals are classified as more honest, have a greater sense of humor and are ascribed as a more sympathetic personality than non-smiling individuals (Mehrabian, 1969; Palmer & Simmons, 1995; Hess, Beaupré, & Cheung, 2002). In addition, Otta and colleagues (1994) found that a broad smile is associated with leadership effectiveness. However, besides positive findings, numerous studies describe contradictory findings regarding smiling which could help explain the rather contradictory findings of this study.

Numerous researchers showed that smiles in social contact are employed for communicative purposes, instead of always representing genuine happiness (Miles & Johnston, 2007). For instance, Ekman and colleagues (1980) administered an experiment with 35 participants. In one of the two conditions, the participants were exposed to unpleasant video content (e.g., a video wherein a man dies due to an accident), intended to elicit inconvenient feelings. Some of the participants displayed smiles during the exposed video content, although their self-report indicated that they were experiencing negative emotions like pain and fear (Ekman, Friesen, & Ancoli, 1980). In a similar vein, later studies confirmed these findings and signify that smiles are often used as a communicative instrument to, for instant, suppress a negative feeling (Ekman & Friessen, 1982), such as dislike, anxiety, embarrassment and distress (Ansfield, 2007; LaFrance, Hecht, & Paluck, 2003; Hess, Beaupré, & Cheung, 2002), or reduce tension in social contact (Hess et al., 2002). Hence, a smile has various other functions than the expression of a positive experience.

People are able to distinguish and recognize enjoyment smiles (i.e., a representation of a felt positive emotional experience) and non-enjoyment smile (i.e., a representation of a non-positive emotional experience) (Miles & Johnston, 2007). These non-enjoyment smiles could be perceived as inauthentic (Krumhuber, Manstead, & Kappas, 2007). Research findings signify that a perceived inauthentic smile is related to judgements of untrustworthiness (Krumhuber, Manstead, & Kappas, 2007; Johnston, Miles, & Macrae, 2010). These findings are in line with a later study of Côté, Hideg and van Kleef (2013) who indicated that faking emotions could create mistrust, which could have an adverse influence on the perception of leadership effectiveness (Savolainen & Häkkinen, 2011). Although we do not have information that this occurred in the current study, this might be a recommendation for further research. Several studies showed that the intensity of the smile, indicating the exuberance of the expression, significantly predict the judgement of the authenticity of the smile (Korb, With, Niedenthal, Kaiser, & Grandjean, 2014;

Krumhuber, Kappas, & Manstead, 2013; Mehu, Mortillaro, Bänziger, & Scherer, 2012). A follow-up study could code the intensity of the smile and examine the relation with effective leadership.

In addition, the position of the experts who judged the leadership effectiveness of the middle managers is noticeable; they are managers in higher management functions. The literature suggests that managers in such high functions are dominant personalities and this could influence how they rate their subordinates (Peterson, Smith, Martorana, & Owens, 2003). The leadership effectiveness evaluation could be susceptive to the similarity-attraction phenomenon, meaning that supervisors provide higher ratings to subordinates who are alike (Byrne, 1971). Further evidence for this mechanism comes from scholars in the area of leader-member exchange (LMX) who hint that similarity between supervisor and subordinate indeed positively affects the job performance evaluation of followers (e.g., ; Engle & Lord, 1997). This could have important implications for the current findings. Specifically, experts in the current study, who are part of higher management, evaluated the leadership effectiveness of the middle managers. It could well be that these high ranking managers, who themselves are likely to exhibit dominant characteristics (e.g. Peterson et al., 2003) prefer similar expressions of dominance in their followers and *therefore* evaluate subordinates (i.e. the leaders in the current study) who express similar dominant expressions *higher* on leadership effectiveness. Indeed, the results of study 2 appear to support this proposition. Specifically, these results indicated that leaders who emanate higher levels of power were rated higher on leadership effectiveness by their supervisors. These findings support the similarity hypothesis in that people who are alike, rate similar individuals more favorably.

In contrast, middle managers who express behavior opposite to the preferred power-related behavioral tendencies of their supervisors (such as smiling) are potentially evaluated as less effective. Indeed, research suggests that people who display acts of smiling are often perceived as being warm, supportive and of relatively low-power status (Henley & LaFrance, 1984). The findings of the current study back this hypothesis, indicating a negative relationship between leaders' smiling behavior and expert ratings of leadership effectiveness. Unfortunately, study 2 revealed no link between smiling and power perceptions. Future research should examine, using a large sample, whether power is an important mechanism in this relationship. Smiling could lead to perceptions of low power, which could influence the perceived leadership effectiveness of experts.

Furthermore, the significant correlations hint that lowered eyebrows have a negative

impact on the leadership effectiveness as perceived by the followers. This is in contradiction with the expectation, presented in hypothesis H8. Trichas and Schyns (2012) state that lowered eyebrows are associated with leadership, but various studies describe contradictory findings regarding the interpretation of lowered eyebrows which could help explain the findings of this study. Ruch, Hoffmann, and Platt (2013, p. 99) stated that "In fact, "frowning" seemed to be antagonistic to the perception of joy". Furthermore, lowered eyebrows are described as angry and threatening (Tipples, Atinson, & Young, 2002). These scholars indicate that lowered eyebrows could be interpreted as a negative expression, which could explain the negative correlation between lowered eyebrows and perceived leadership effectiveness of followers.

In sum, we found that more gazing towards the followers has a positive influence on the perception of leadership effectiveness of supervisors and more smiling has a negative influence on the perception of leadership effectiveness of supervisors.

Theoretical implications

Despite numerous studies which underline the importance of leadership and the impact of nonverbal behavior, only a few studies explicitly study this relation and deliver empirical evidence. The current video-observation study contributes to the existing knowledge of nonverbal leadership theory, by the identification of two specific nonverbal behaviors of leaders which impact the perception of supervisors concerning effective leadership. These specific behaviors concern gazing towards the followers and smiling.

Practical implications

Organizations who are aspired to advance should pay more attention to the nonverbal side of leadership. This can be realized by training their leaders on the aspects of nonverbal behavior. Various studies signify that leaders can enhance their nonverbal abilities as a result of training (e.g., Towler, 2003; Frese, Beimel, & Schoenborn, 2003). However, researchers indicate that there is a big gap between the approach of practitioners and scientific research findings (Rynes, Colbert, & Brown, 2002), which also includes leadership practice (Zaccaro & Horn, 2003). Charlier, Brown, and Rynes (2011) found that MBA programs hardly teach evidence-based practices. In line with the demanding of Antonakis, Fenley, and Liechti (2011) for more evidence-based practices in leadership development, we stress the importance of scientific research in the

development of leadership training programs. Being aware of what nonverbal behavior contributes or is detrimental to leadership performance is beneficial for organizational success (Darioly & Schmid Mast, 2014). Based on our research results we recommend that leadership development training should include more focus on the nonverbal behavior of a leader because it influences leadership effectiveness perceptions of supervisors (Talley & Temple, 2015). Specifically, leaders should be informed of the importance of gazing towards their followers and acquainted to prevent excessive smile behavior to improve the leadership performance and accordingly contribute to organizational success.

Strengths, limitations and future research

This study has three main strengths: (1) video-based nonverbal analysis of leadership, (2) field study, (3) triangulation. A strength is that the current study exhibited that nonverbal behavior should be included in the research area of effective leadership. The current research displayed the influence of two specific nonverbal behaviors on effective leadership perceptions of supervisors and contributes accordingly to the scarce literature regarding this research field. This is demonstrated in the current research that is carried out by studying a field setting, which is likewise a strength of the current study. Furthermore, the current study uses a triangulation design regarding the different sources of data (data triangulation) and various methods to gather the data (methodological triangulation), which reduces common source and method bias (Patton, 1999). The usage of the video observation method facilitates the identification of nonverbal behaviors micro behavior which contributes to the perceptions of leadership behavior. The objective and reliable coding process were preceded by a structured development and validation of the coding scheme, which represents a robust method and furthermore a reliable and polished measurement instrument.

Despite these strengths, this study has three main limitations: (1) the small sample, (2) external validity, (3) multiple perspectives of leadership effectiveness. The sample size of 40 leaders and the limited interval sections which are coded in the current research is a limitation. In addition, the applied sample did not use standardized camera position (the meetings were conducted in various locations within the target organization). This could potentially complicate the coding process, but given the inter-rater reliability scores of the coded data, this was not found to be an issue. Antonakis and colleagues (2004) explain that, given that the data is collected in a

field setting, the setting is much harder to control for the researcher. In some of the collected videos were objects in the sight of the leader or the leader was not constant in the view. Therefore, a stimulus selection was conducted preceding the coding of the data. Despite the stimulus selection, the applied sample provides unambiguous, but diversified perspectives of the leaders on the recorded videos, which could be considered as a limitation.

Furthermore, the examined sample originates from one company which operates in the public sector in the Netherlands. Due to the small sample, Western culture and specific company setting, culture and environment, the external validity is limited, meaning that the generalizability is limited. Identical nonverbal behaviors can be defined and interpreted differently among diversified cultures (Bonaccio et al., 2016). However, the results are based upon data gathered in the Netherlands, which enhances the generalizability to European and North American settings (Antonakis, Fenley, & Liechti, 2011). To test whether the generalizability actually is limited, future research could replicate the current study with data originating from other cultures.

In addition, it is recommended to apply the current research design, but enhance and increase the amplitude of the time coded and include video data of other companies in future research. Moreover, the current study employs two different perspectives of leadership, that of the followers and supervisors of the leader (e.g., Yoon, 2008). Due to the uncorrelated relation between the follower and supervisor scores regarding the effectiveness of the leaders in the selected sample of 40 leaders, we employed them as two different perspectives. Fairholm (2004) explains this by presenting different perspectives of leadership, and these different perspectives define effective leadership differently. The experts could have other criteria to rate the leader as effective than the followers (Fairholm, 2004). In the current study, both of the perspectives are included, which led to two different measures of effective leadership. The absence of one measure of effective leadership could be considered as confusing and likewise as a limitation of the current study. However, in the complete sample, existing of 109 leaders, the supervisor and followers scores do correlate significantly[6].

Multiple scholars emphasize further research towards nonverbal leadership theory (e.g., Darioly & Schmid Mast, 2014). The current research provides multiple recommendations concerning future research, as some of them are proposed above. Therefore, we present the following three recommendations for future research:

[6] (r = .371), sig. = ,027

Recommendations 1: The current study provides insight in the occurrence of separate nonverbal behaviors, but does not include pattern analysis of effective leadership behavior. Burgoon and colleagues (2015) studied the pattern of nonverbal behavior in face-to-face interview in regards to trust and deceptiveness intentions of individuals. They identified different patterns with regards to the person's intentions and recommended, without explicit guidance regarding specific topics, further appliance of pattern analysis in the behavior research area. As follow-up of this study, a pattern analysis regarding the nonverbal behaviors of leaders in relation to leadership effectiveness is legitimized. The identification of patterns which influences the perceptions of effective leadership could contribute to nonverbal leadership theory.

Recommendations 2: Furthermore, previous scholars focused on behavior of leaders extracted based upon primarily verbal utterance. Hoogeboom and Wilderom (2015b) coded and analyzed leadership behaviors regarding structuring (directing, informing and structuring) in relation to leadership effectiveness in staff meetings, primarily based on the verbal utterance. The literature regarding the relation and combination of verbal and nonverbal behavior linked to the leadership effectiveness context is very scarce and is an opportunity to study. Exploring the bilateral relation of the different expressions of behavior might yield new insights.

Recommendations 3: Studies which apply the video-observational method regularly code and analyze observations which are gathered from one point in time. Although the literature on this subject matter suggests that nonverbal behavior is stable across time and context, limited empirical evidence is available regarding nonverbal behavior and longitudinal research (Weisman, 2010). To fill the gap in the literature and explore the stability of nonverbal behavior, a longitudinal study could be conducted by gathering multiple observations over time.

To conclude, there are numerous other further research recommendations regarding this study. Therefore, an additional research agenda was made, which can be found in Appendix I.

Conclusion

In the current study, we analyzed the nonverbal behavior of middle managers in relation to their leadership effectiveness, fueled by the research question: *"What specific nonverbal behaviors of leaders in meeting settings impact leadership effectiveness as perceived by their followers and experts?"* The current study indicates that nonverbal behavior of middle managers in a staff meeting affects the perceptions of effective leadership of their supervisors. We identified two

behaviors which significantly impact the leadership effectiveness perceptions of supervisors. Longer gazing towards the followers relates positively to perceptions of leadership effectiveness of supervisors. The gazing towards the followers indicates attention and engagement, which is positively associated with leadership. Furthermore, the results show that more frequent displays of smiling have a negative impact on the perceptions of leadership of supervisors. This might be explained by the fact that individuals with lower power laugh more often. These findings contribute to the scarce literature which is available on specific nonverbal behaviors in relation to leadership effectiveness and could contribute to the development of leadership training.

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APPENDIX

Appendix A

Study 2

Method

Research design

This study has a cross-sectional design, with four different data sources: (1) experts rated The effectiveness of 40 leaders, (2) a survey measured followers' perceptions (e.g. leadership effectiveness), (3) systematic video-based coding was used to quantify the leader's' nonverbal behaviors during regular staff meetings, (4) perceptions of bachelor students regarding the leadership effectiveness and personality traits of leaders based upon thin slices. On using this variety of methods and sources, common method/source bias was not a great threat in this study (Podsakoff, MacKenzie, & Podsakoff, 2012). This study's outcome criteria is leader effectiveness; which is used in most meta-analyses and effective leadership studies (DeRue et al., 2011; Dumdum, Lowe, & Avolio, 2002; Seltzer & Bass, 1990).

Procedure

The selected fragments were displayed to 13 undergraduates, which were unfamiliar with the leaders (naive observers). The 10-seconds silent fragments (sampled from the staff meetings) were shown to the undergraduates, which rated personality traits (which are related to leadership) of the concerned leader immediately after the 10-second clip (Rule & Ambady, 2008). The participants were asked to answer six questions after each clip concerning the appearance of the leaders. Adjacent to this guidance, the participants received no further instructions nor training. They judged the leader in every clip on leadership effectiveness and five personality traits (likeability, warmth, competence, facial maturity and dominance) on a 7 point Likert scale. To reduce possible confusion about the identity of the manager in these clips, a prompt appeared prior to the showing of the fragments to participants identifying the manager (e.g. "In the next three clips, the manager is the woman on the left"). Every fragment was presented once, followed by an interlude to provide the participants adequate time to finalize their ratings.

Before the start of the actual survey, an exercise round was conducted to allow the participant to get used to the procedure. In this exercise round, a random leader was displayed,

who was not part of the 40 selected leaders. The survey software allocated every participant 90 fragments (30 of the 40 leaders, on average 9.75 raters per leader), in a randomized order. This implies that every leader was rated by a divergent group of raters. The participants did not rate all 120 fragments due to the extensive duration of the session. An inclusion of all fragments might cause a motivational deficit towards the end of the session, and therefore it was decided to reduce the number of fragments per undergraduate.

The group of 13 undergraduates (seven female, six male) had an average age of 20.4 years (ranging from 18 to 29, *SD* = 3.0). Except one of the 13 undergraduates, which had one to three years' experience in a managerial function, none of the participants had a leadership background. The undergraduates pursued a honors program and their participation was completely voluntarily, the participants were free to withdraw themselves at any moment during the session.

Measures

The applied measures regarding leadership effectiveness (both experts and followers) and the measurement of the leader's nonverbal behaviors are identical to those used in Study 1. See p. 47 for more information.

Personality traits and leadership effectiveness judgements by naive observers

The traits of the leaders were measured through ratings of 13 undergraduates, as described in the procedure. The students evaluated the (1) competence, (2) dominance, (3) facial maturity, (4) trustworthiness, (5) likeability on a 7-point Likert scale varying from 1 ("not at all) to 7 ("very"). Furthermore, the students also gave a judgement regarding the leadership effectiveness of the leader. An example of an item is "This manager is dominant". The applied traits are selected accordingly to Rule and Ambady (2008). A graphical representational of the above described process is shown below, in Figure 4.

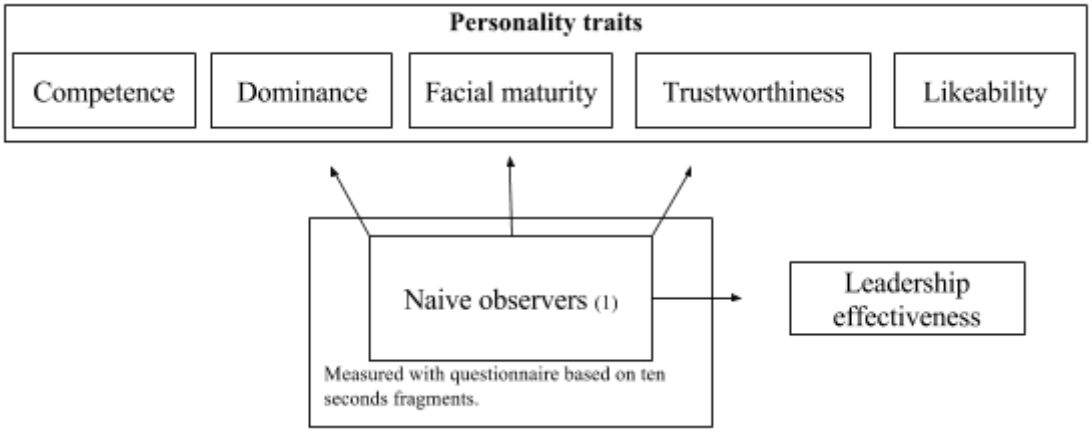


Figure 4 - Personality traits

Attractiveness

Physical attractiveness could influence both the dependent variable (leadership effectiveness rated by experts and followers) and the independent variable (ratings of naive observers based on the ten second clips) (Ambady & Rosenthal, 1993). Suppose the dependent and independent variable do correlate, it might be caused by the physical presentation of certain leaders instead of their nonverbal behavior. Riggio, Widaman, Tucker, & Salinas (1991) differentiate two types of attractiveness, static and dynamic attractiveness. Static attractiveness concerns the physical attractiveness (e.g. "beautiful eyes") and dynamic attractiveness concerns facets of motions and expressive behavior, which are related to personality differences between people (e.g. "he looks self-confident") (Anderson, John, Keltner, & Kring, 2001). In this study there will be controlled for physical attractiveness, because physical attractiveness is independent of the behavior of a leader, but could influence the perception (Riggio et al., 1991; Langlois et al., 2000). To obtain the physical attractiveness disengaged of the dynamic attractiveness dimension, the attractiveness ratings were based on the ten seconds listening behavior fragment (Anderson et al, 2001). The leaders were sitting comparative motionless during the used clips, which allows judgement of static attractiveness

Attractiveness is measured through ratings of eight students on a 7-point Likert scale varying from 1 (very unattractive) to 7 (very attractive). The eight students[7] (four females, four males) had an average age of 22,25 (ranging from 19 to 26, *SD* = 2.3). The agreement between the raters was substantial, as signified by the Rwg of .70, an ICC1 value of .43 ($p < .001$) and ICC2 of

[7] None of the students who gave attractiveness ratings were part of the group who provided personality traits and effectiveness ratings.

.83 (p < .001) (Bliese, 2000). Since the agreement between raters is substantial, it is allowed to aggregate the data per leader (Bliese, 2000; LeBreton & Senter, 2008). Therefore, every leader received the mean score of the eight judges as him or her attractiveness variable score. A graphical representational of the above described process is shown below, in Figure 5.

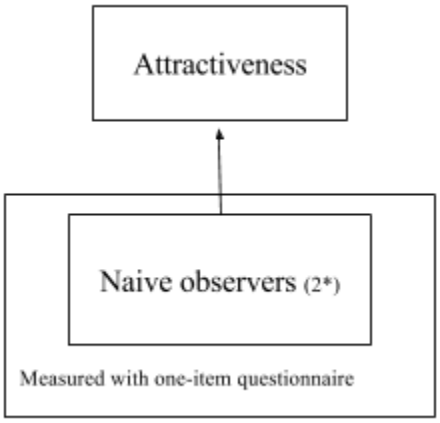


Figure 5 - Attractiveness

Analytical procedures

To examine if the five personality traits share underlying factors, a principal component analysis was conducted following Rule and Ambady (2008). To review whether it is appropriate to run a factor analysis, a Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was conducted[8]. The KMO test was > .50 (.696) (which indicates that the factor analysis could distinct reliable factors (Field, 2013). Considering the same source of the data, an oblique rotation (direct oblimin) was performed, which allows for correlated factors (Field, 2013). Furthermore, a Bartlett's test was administered to test the homoscedasticity of the data (Field, 2013). The Bartlett's test was significant (χ^2 (10) = 192.53, p < .05), which indicates equal variance (Field, 2013). Hence, a factor analysis is pertinent to perform.

The factor analysis indicates that there are two underlying factors, with four variables loading heavy on one of the two factors and one complex variable which loads on both factors, which was assigned to the factor with the highest loading (Brown, 2009). The two-factor formation was identical to the findings of Rule and Ambady (2008): a Power composite containing

[8] Despite a relative low number of respondents, every respondent filled 90 evaluations in. The factors contain heavy loadings (>.80) of the components, which makes a factor analysis reliable (Guadagnoli & Velicer, 1988).

dominance, facial maturity and competence (69.9% variance explained) and a Warmth composite containing trustworthiness and likeability (18.4% variance explained). For the two composites (corresponding to the factors), the means were calculated based on the trait scores, meaning the higher the score, the more a manager is perceived as Powerful or Warm (Rule & Ambady, 2008). Subsequent analyses use the Power and Warmth composites, as opposed to individual items. A graphical representational of the above-described process is shown below, in Figure 6.

Figure 6 - Warmth and Power

Considering the influence of attractiveness concerning the judgements of presence (Langlois et al., 2000), there will be controlled for attractiveness in the correlations. Furthermore, the differences in gender and age could influence the impression of the leader's (Eagly, Makhijani, & Klonsky, 1992; Rule et al, 2008). Therefore, there will also be controlled for the age and gender in the correlations.

The purpose of this study is to examine the relation between leadership effectiveness and the attitude and impression which the leader exposed, and if naive observers can distinguish the most effective leaders from the least effective leaders based upon these impressions. To assess this relation correlations and regression analysis were conducted (Field, 2013). To revise whether Pearson correlations is appropriate, all variables were tested for normality by the Shapiro-Wilk normality test (Field, 2013). Furthermore, to evaluate if naive observers were able to distinct the most and least effective leaders, the five most effective and five least effective leaders were selected based upon experts scores. Subsequently, the effectiveness ratings of the naive observers of these two groups were compared by means of an one-way ANOVA to examine significant difference (Field, 2013). In all test a significant level of $p = <.05$ is utilized.

Results

Inter-rater agreement

The within-group agreement specifies the extent to which the raters (naive observers) provide indistinguishable ratings regarding a trait per leader (Lindell and Brandt, 1999). Table 7 displays several measures of agreement between the raters regarding the traits. Rwg is the standard measure of inter-rater agreement in organizational studies, and this measure is applied as mean indicator of inter-rater reliability (Bliese, 2000). The Rwg scores vary between .92 and .88, which indicate strong interrater agreement among all variables (Castro, 2002). The Rwg scores transcends the threshold of .7 for aggregation. Therefore every leader got one score per trait assigned, which were used to construct the composites (Lance, Butts, & Michels, 2006).

Table 7 - Agreement between raters

Variable	MSR (between group variance)	MSW (within group variance)	ICC2	ICC1	RwG
Competence	2.47	0.84	0.66	0.17	0.92
Dominance	2.41	1.15	0.52	0.10	0.88
Liking	3.78	1.02	0.73	0.22	0.90
Trustworthiness	2.42	1.07	0.56	0.12	0.89
Facial maturity	1.79	0.93	0.48	0.09	0.91
Effectiveness	2.34	0.82	0.65	0.16	0.92
		Average	0.60	0.14	0.90

Correlations between leadership effectiveness and judgements of naive observers

Table 8 displays the correlation matrix between leadership effectiveness of experts and followers and the leadership traits rated by naive observers. To show the impact of the control variable(s), the correlation matrix exhibits the partial correlations and the simple correlations, of which the last one is for illustration purposes. Within the control condition only the power composite (r =.34, p <.05) is significant related to leadership effectiveness (by experts). Furthermore, the judgement of leadership effectiveness by naive observers is highly correlated with their judgements of Power (r =.87, p <.001) and Warmth (r =.77, p <.001) traits. In addition,

the simple correlations show the influence of attractiveness on effectiveness judgements by naive raters (r =.65, p <.001), Power (r =.50, p <.001) and Warmth (r =.57, p <.001). Which implies that the attractiveness of a leader is positively associated with the leadership effectiveness (naive judgements), Power and Warmth traits. One of the other controlling variable, age, does not correlate significant with a variable.

Table 8 - Correlations between leadership traits (student ratings) and measures of leadership effectiveness (experts and follower ratings).

	1	2	3	4	5	6	7
1 Leadership effectiveness [experts]		0.17	0.24	0.34*	-.05		
2 Leadership effectiveness [followers]	0.25		0.32	0.31	0.17		
3 Effectiveness judgement [naive raters]	0.36*	0.33*		0.87***	0.77***		
4 Power	0.42**	0.31	0.89***		0.46***		
5 Warmth	0.15	0.26	0.85***	0.62***			
6 Age	0.02	-0.08	-0.03	0.17	-0.06		
7 Attractiveness	0.26	0.17	0.65***	0.50***	0.57***	-0.25	
8 Gender	0.22	0.30	0.18	0.07	0.26	-0.42***	-0.30

Note. Values above the diagonal are partial correlations controlling for the covariates (age, attractiveness, gender; df = 34). Values below the diagonal are simple correlations (df = 37). $^{*}p < .05$. $^{**}p < .025$. $^{***}p < .001$

The relation between Warmth & Power traits and leadership effectiveness

To assess the relation between Warmth- & Power traits and leadership effectiveness were regression analysis performed. The independent variable was Power or Warmth, and the dependent variable was leadership effectiveness scores of expert and followers.

Power

There was a simple linear regression analysis conducted between the power traits of a leader's and the leadership effectiveness scores of experts. A significant linear regression equation was identified (F (1,37) = 8,088, p = .007), with an R^2 of .179 (β= .424). Figure 7 gives a graphic representation regarding the regression. These findings signify that the more a leader emanates power, the better an expert's rates this leader.

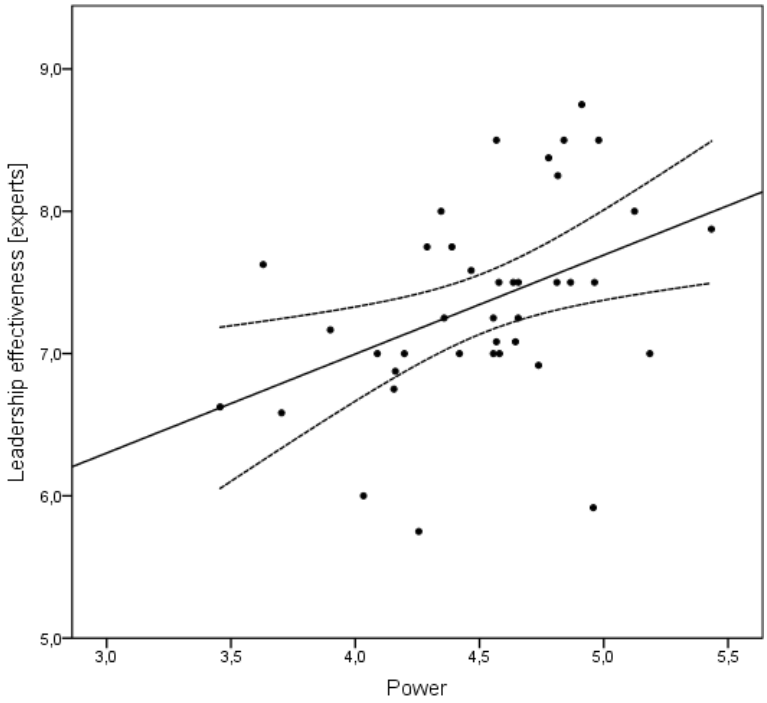


Figure 7 - Relation between Power and Leadership effectiveness scores of experts

There was a simple linear regression analysis conducted between the power traits of a leader and the leadership effectiveness scores of followers. There was no significant regression equation identified. However, a significant quadratic regression equation was identified (F (2, 37) = 4,715, p = .015), with an R^2 of .203. The quadratic equation is; Leadership effectiveness score of followers = -12,281 + 7,543x[9] - 801x^2 . Figure 8 gives a graphic representation regarding the regression. This result signifies that followers prefer a leader who does emanate considerable extent of power. However, a too powerful emission is not desirable for the followers.

[9] x= power score of leader

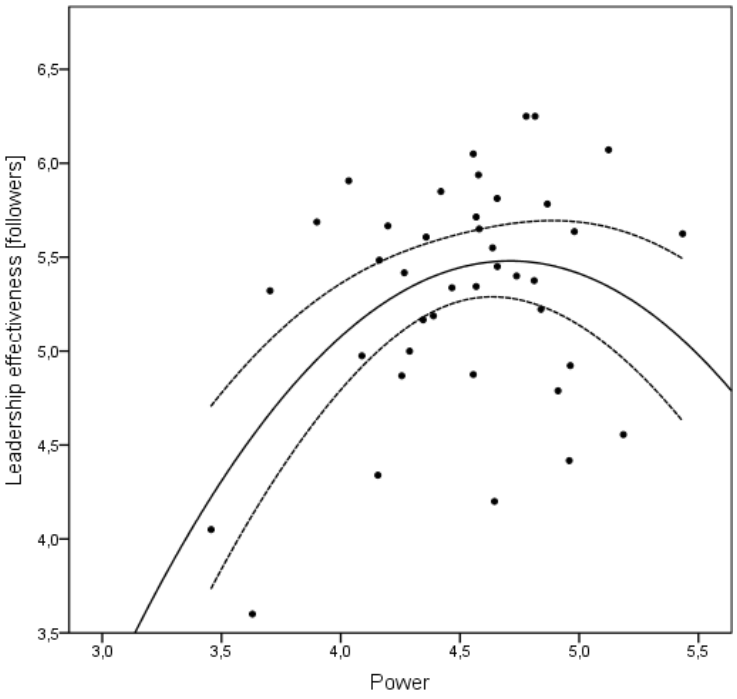


Figure 8 - Relation between Power and Leadership effectiveness scores of followers

Warmth

There was a simple linear regression analysis conducted between the warmth traits of a leader's and the leadership effectiveness scores of experts. No significant linear regression equation was identified (F (1, 37) = 796, p = >.05), with an R^2 of .021 (β= .145). Furthermore, no other relation was found between the two variables.

Furthermore, a simple linear regression analysis was conducted between the warmth traits of a leader's and the leadership effectiveness scores of followers. No significant linear regression equation was identified (F (1, 37) = 2,771, p = >.05), with an R^2 of .068 (β= .261). However, a significant quadratic regression equation was identified (F (2, 37) = 5,304, p = .009), with an R^2 of .223. The quadratic equation is; Leadership effectiveness score of followers = -9,004 + 6,570y[10] - ,742y^2 . Figure 9 gives a graphic representation regarding the regression. This result signifies that followers prefer a leader which emanates a medium amount of warmth. As shown in the figure, the sweetspot abides approximately in the middle of the warmth spectrum in Figure 9.

[10] y= power score of leader

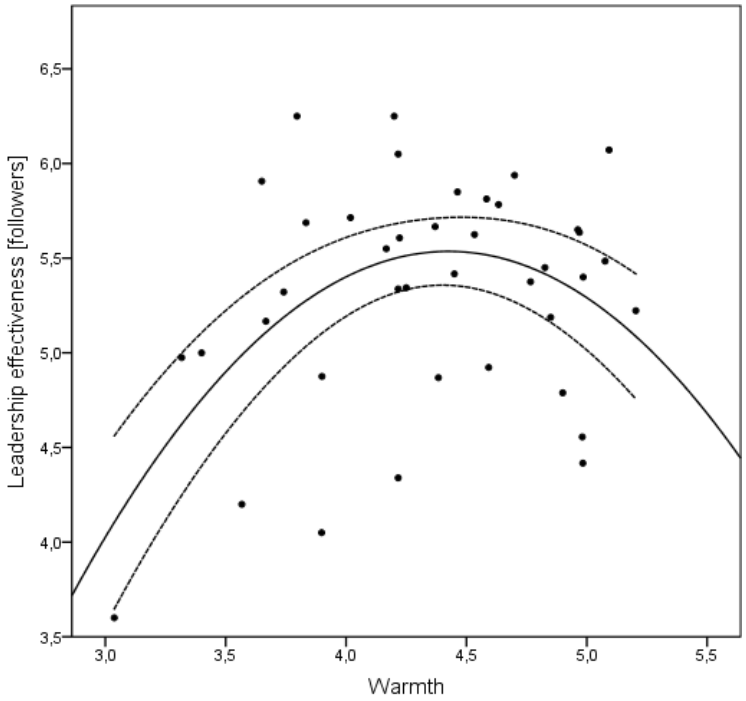


Figure 9 - Relation between Warmth and Leadership effectiveness scores of followers

Most and least effective leaders

Table 9 displays the descriptive statistics of the five most effective and five least effective leaders (N=10) selected upon leadership expert scores. There was a significant relation ascertained between the expert scores regarding the five most effective leaders (M = 8.53, SD = 0.1) and the five least effective leaders (M = 6.18, SD = 0.4); $t(8) = 12.37$, $p = .000$. Furthermore, the most effective leaders score on average better on leadership effectiveness, Warmth and Power traits, as rated by the naive observers.

Table 9 - Test statistics concerning the five most effective leaders and the five least effective leaders

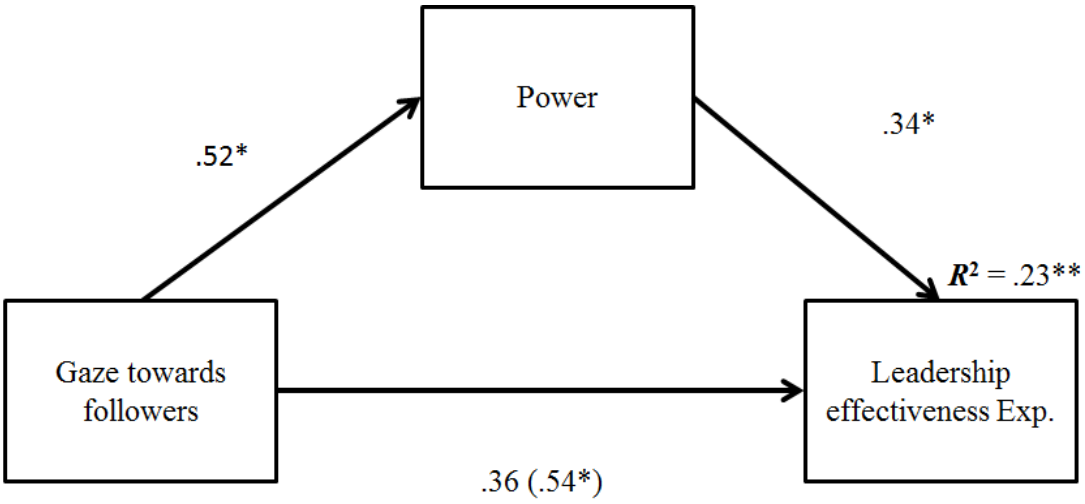
	Effectiveness score experts	*t*	*p*	Effectiveness score naive observers	*t*	*p*	Warmth	*t*	*p*	Power	*t*	*p*
Five most effective leaders	8.53	12.367	.000	4.81	2.726	.026	4.70	1.793	.111	4.82	2.741	.025
Five least effective leaders	6.18			4.00			4.13			4.08		

To test whether there is a significant difference in the leadership effectiveness score of naive observers between the two groups, an analysis of variance was conducted. There was a significant difference in the scores of the five most effective leaders (M = 4.82, SD = 0.3) and the five least effective leaders (M = 4.00, SD = 0.6); $t(8) = 2.73$, $p = .026$. These findings demonstrate that naive observers are able to distinguish the effective leaders from the less effective leaders based upon thin slices of 3x10 seconds.

In addition, there was also a significant difference in the power score: the score of the five most effective leaders (M = 4.81, SD = 0.2) and the five least effective leaders (M = 4.08, SD = 0.6); $t(8) = 2.74$, $p = .025$. These findings indicate that the five most effective leaders have a more powerful expression than the five least effective leaders. These findings are in line with the findings in 5.x. Furthermore, there were no significant differences between the five most, and five least effectiveness leaders on the warmth score.

Mediation model

We conducted multiple regression analysis to determine the components of the displayed mediation model (Figure 10). The first regression showed that Gaze duration towards followers was positively associated with Leadership effectiveness (experts) (B = .54, t (37) = 2.34, $p = .025$). Furthermore, gaze duration towards followers was positively related to Power (B = .52, t (37) = 2.26, p = .030). The mediator, power, is positively associated with perceptions of leadership effectiveness of experts (B = .34, t (37) = 2.18, $p = .036$). This indicates that the a- and b-path are both significant. Hence, we utilized bootstrapping with bias correlated confidence interval to test the mediation. We utilized a 95% confidence interval and used a bootstrap resample amount of 5000. The outcome of the analysis displayed the mediating role of Power in the mediation model between gazing towards followers and Leadership effectiveness (B = .18; CI = .01 to .51). Furthermore, the mediation model signifies that the direct relation of Gazing towards followers on Leadership effectiveness is non-significant (B = .36, t (37) = 1.54, $p = .13$) when controlling for Power, which signifies a full mediation (Gunzler, Chen, Wu, Zhang, 2013). Figure 10 presents a graphical representation of the above-described findings.



Note: * p <.05, ** p <.01

Figure 10 - Indirect effect of gaze towards followers on leadership effectiveness through power

Appendix B

Coding Scheme

Coding schemes are used to analyze observational data, especially of social interaction, to quantify behavior (Bakeman, 2005). The coding scheme can be considered as a measure instrument in observational data research (Bakeman, 2005). A coding scheme exists of a pre-determined list of behavioral classifications (codes) depicting the behaviors (and their operationalization) which will be observed and coded (Bakeman, 2005). An example of a code is a 'closed smile', which is operationalized as "the mouth corners are drawn up and out while the teeth remain covered". Subsequently, the coders examine the video data and code the occurrence of the behaviors accordingly.

These codes can be intended to a measure a wide scale spectrum of concreteness and fineness (Bakeman & Gottman, 1997). Concerning the concreteness, there is a clear distinction between physically based codes (e.g. muscle movements, closed smile) and socially based codes (e.g., ratings of smile intensity on a 7-point scale). In the ideal situation are human judgements excluded in the coding process of physical codes. In physically coding several recognized software programs are developed to code the data (e.g., Won, Bailenson & Janssen, 2014). On the other hand, socially based codes require the influence of human judgements (Bakeman & Gottman, 1997). Furthermore, the coding process could be focused on micro behaviors, which implies the coding of minuscule, concrete and very specific behavior (e.g. self-touches), or macro behavior, which includes a more global measurement and the coding of combined behavior (e.g. hand gestures) (Burgoon & Baesler, 1991). In this research, a coding scheme is developed established of physically codes which will observe micro behavior.

Appendix C

Thin slices

What are thin slices

Thin slices are brief observations of expressive behavior which are in duration smaller than 5 minutes (Ambady & Rosenthal, 1992). Ambady (2010, p. 271) describe thin slices as follows "Thin slices of expressive behavior are random samples of the behavioral stream, less than 5 min in length, that provide information regarding personality, affect, and interpersonal relations". As aforementioned mentioned, numerous studies showed the predictive validity of these thin slices on various outcome variables (Ambady, 2010). Ambady & Rosenthal (1992) administered meta-analysis, including 38 studies, concerning the thin slices methodology and concluded that judgements made on thin slices are accurate. Ambady (2010) states that over 100 studies showed that substantial information concerning social interaction functioning could be obtained by looking to brief observations of behavior. Furthermore, judgement made upon thin slices of 5 minutes did not provide significant more accurate judgements than judgements made upon half a minute (Ambady & Rosenthal, 1992).

NVB and thin slices

An example of judgements based upon NVB in this slices is of Ambady and Rosenthal (1993). Subsequent their meta-analysis, Ambady and Rosenthal (1993) carried out a thin slices studied in which naive raters judged college teachers based upon nonverbal behavior. The teachers were filmed during an random class, and three fragments of ten seconds were selected (audio was stripped) from this videotape and shown to naive undergraduates. These undergraduates rated the teachers in the clips, which turned out to significantly predict the student evaluations of these teachers.

Appendix D

Table 10- KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.70
Bartlett's Test of Sphericity	*Approx. Chi-Square*	192.53
	df	10
	Sig.	0.000

Appendix E

Table 11 - Test of normality; Shapiro-Wilk

	Shapiro-Wilk		
	Statistic	df	Sig.
Age	0.956	39	0.132
Leadership effectiveness score followers	0.949	39	0.076
Leadership effectiveness score naïve observers	0.964	39	0.243
Leadership effectiveness score experts	0.968	39	0.321
Power	0.980	39	0.698
Warmth	0.959	39	0.166
Attractiveness	0.953	39	0.101

Appendix F

Table 12 - ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.642	1	1.642	7.433	0.026
Within Groups	1.767	8	0.221		
Total	3.409	9			

Appendix G

Table 13 - Selection observational data

Team number	Gestures	Head movements	Facial expressions	Gaze orientation	Posture
1	All cues are visible	Almost all cues are visible	Insufficient	All cues are visible	Almost all cues are visible
2	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
3	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
4	Almost all cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
5	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
6	All cues are visible	All cues are visible	Insufficient	Insufficient	All cues are visible
7	Insufficient	All cues are visible	All cues are visible	All cues are visible	All cues are visible
8	Almost all cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
9	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
10	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
11	Almost all cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
12	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
13	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
14	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient
15	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
16	All cues are visible	All cues are visible	Almost all cues are visible	Almost all cues are visible	All cues are visible
17	Almost all cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
18	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
19	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
20	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
21	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
22	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible

23	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
24	All cues are visible	All cues are visible	Insufficient	Almost all cues are visible	All cues are visible
25	Insufficient	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
26	Insufficient	All cues are visible	Insufficient	All cues are visible	All cues are visible
27	Almost all cues are visible	All cues are visible	Insufficient	Insufficient	All cues are visible
28	Insufficient	All cues are visible	Insufficient	Almost all cues are visible	All cues are visible
29	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
30	Insufficient	All cues are visible	Insufficient	All cues are visible	Insufficient
31	All cues are visible	All cues are visible	Insufficient	Insufficient	All cues are visible
32	Insufficient	Almost all cues are visible	Insufficient	Insufficient	Insufficient
33	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
34	Insufficient	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
35	Insufficient	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
36	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
37	Insufficient	All cues are visible	Insufficient	All cues are visible	All cues are visible
38	Insufficient	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
39	Insufficient	All cues are visible	Insufficient	All cues are visible	All cues are visible
40	Almost all cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
41	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
42	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
43	Almost all cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
44	Almost all cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
45	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible

46	Insufficient	All cues are visible	Insufficient	Almost all cues are visible	All cues are visible
47	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
48	All cues are visible	All cues are visible	Insufficient	Insufficient	All cues are visible
49	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
50	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
51	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
52	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
53	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
54	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
55	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
56	All cues are visible	All cues are visible	Almost all cues are visible	Almost all cues are visible	All cues are visible
57	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
58	All cues are visible	All cues are visible	Almost all cues are visible	Insufficient	All cues are visible
59	All cues are visible	All cues are visible	Insufficient	Almost all cues are visible	All cues are visible
60	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
61	Insufficient	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
62	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
63	Almost all cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
64	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
65	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
66	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
67	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
68	All cues are visible	All cues are visible	Almost all cues are	All cues are visible	All cues are visible

			visible		
70	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient
71	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
72	All cues are visible	All cues are visible	Almost all cues are visible	Almost all cues are visible	All cues are visible
73	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
74	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
75	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
76	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
77	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
78	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
79	Almost all cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
80	Insufficient	Insufficient	Insufficient	Insufficient	Insufficient
81	Insufficient	All cues are visible	All cues are visible	All cues are visible	All cues are visible
82	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
83	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
84	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
85	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
86	Almost all cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
87	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
88	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
89	Insufficient	All cues are visible	Insufficient	All cues are visible	All cues are visible
90	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
91	Insufficient	All cues are visible	All cues are visible	All cues are visible	All cues are visible
92	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
93	All cues are visible	All cues are visible	Insufficient	Almost all cues are visible	All cues are visible

94	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
95	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
96	Almost all cues are visible	All cues are visible	Insufficient	Almost all cues are visible	All cues are visible
			Pilot teams		
1	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
2	Insufficient	All cues are visible	All cues are visible	All cues are visible	All cues are visible
3	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
4	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
5	All cues are visible	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible
6	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
7	Insufficient	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
8	Insufficient	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
9	All cues are visible	All cues are visible	Insufficient	Almost all cues are visible	All cues are visible
10	All cues are visible	All cues are visible	Almost all cues are visible	All cues are visible	All cues are visible
11	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
12	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible
13	All cues are visible	All cues are visible	Insufficient	All cues are visible	All cues are visible
14	All cues are visible	All cues are visible	All cues are visible	All cues are visible	All cues are visible

Appendix H

Table 14 - Gesture cues rejections

	Frequency
Due to an object in the view / vision	10
Audio is not synchronous with the video	4
No audio included	4
No video available	2
Due to the fact that there is no video available with a decent angle to measure this	1
due to the fact that the person is not always in the view of the camera	1
Total	**22**

Table 15 - Hand cues rejections

	Frequency
No video available	2
due to the fact that the person is not always in the view of the camera	1
Total	**22**

Table 16 - Facial expression cues rejection

	Frequency
Due to an object in the view / vision	23
Due to the fact that there is no video available with a decent angle to measure this	9
No video available	2
Due to an object in the view / vision	2
Due to the fact that the person is not always in the view of the camera	1
Due to eyeglasses	1
Total	**38**

Table 17 – Rejection gaze orientation

	Frequency
No video available	2
Due to an object in the view / vision	1
due to the fact that the person is not always in the view of the camera	1
Due to the fact that there is no video available with a decent angle to measure this	1
Total	**5**

Table 18 - Posture rejection

	Frequency
Due to the fact that there is no video available with a decent angle to measure this	4
No video available	3
due to the fact that the person is not always in the view of the camera	1
Due to unsharp / low resolution	1
Total	**9**

Appendix I

Additional research agenda:

- The current research was intended to identify specific behaviors which affect the leadership effectiveness. But there is very little known about the formation of perceptions regarding effective leadership. Some scholars signify that the formation of perception of effective leadership is mediated by perceptions of trustworthiness and credibility (DeGroot, 2011; Teven, 2007; Richmond & McCroskey, 2000). Future research towards the mechanisms which could influence perceptions of effective leadership might yield valuable insights regarding the development and composition of leadership effectiveness perceptions.
- The current research examined the nonverbal behavior of 40 leaders. These leaders were selected based upon the visibility of the cues (as described in the method section). This was the only selection criteria because this reduced the ambiguity during the coding process. However, further research could select the leaders based upon leadership effectiveness score as primary criteria. Investigating the best and the worst leaders might yield valuable insights.
- Our research is solely focused on the behavior of the leader. However, the behavior of the followers also influences the workplace. The literature suggest that mimicry is an important element of interaction and leadership (e.g., Meyer, Burtscher, Jonas, Feese, Arnrich, Tröster & Schermuly, 2016). Investigating the mimicry of followers and leaders might yield valuable insights.
- There is very little known about abusive leadership behaviors. Although, it is know that abusive leadership behavior is detrimental to leadership effectiveness and organizational success. Investigating and identification of abusive leadership behaviors might yield valuable insights.
- The current study used questionnaires and video observations to identify behaviors which affect the leadership effectiveness. Future research could include and combine new measurement instrument. (e.g., monitor the nervous system or tracks the eye movements of leaders). The measures and combination of these new instruments might yield valuable insights regarding the physical aspects of effective leadership.
- Regarding the methodology for further research, researchers may consider coding all of the

data by consensus (two coders and a third coder to resolve disagreements) or researchers may consider double coding all data and using some summary of these ratings or statistical models to estimate, and thereby control, for inter-observer variance (Lei, Smith, & Suen, 2007). This method may improve the efficiency of the coding process.

Appendix J

Not available