Relating leader gender, nonverbal leader behavior, transformational leadership and follower trust in leader to team effectiveness: a multi-method video-observational study

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ABSTRACT

The division between men and women in leading positions is unequal in both private and public sectors, having often two times as many men than women in charge Whether this difference is justified by the gender differences in leadership effectiveness was researched in this paper. 45 leaders were studied on their leadership style, nonverbal leader behavior, follower trust, and team effectiveness. The data was obtained via video-taped meetings led by the leaders and by questionnaires filled in by followers and leaders after the meetings. The nonverbal behavior of the leaders is meticulously coded for thirty minutes per meeting by two raters with the use of a pre-defined codebook. To test the hypotheses, independent t-tests and regression analyses were conducted. The results indicated that female and male leaders exhibited equal levels of transformational leadership, while female leaders showed different nonverbal behavior, such as displaying more smiles and less raised eyebrows, compared to male leaders during regular staff meetings. Moreover, transformational leadership was found to be a predictor of follower trust, but follower trust was not a predictor of team effectiveness. Implications for practice and future research are discussed.

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1. INTRODUCTION

Of the S&P 500, 26 companies have a female CEO, which is 5.2% (Catalyst, Women CEOs of the S&P 500, 2017). Within the S&P 500, senior management positions are for 26.5% filled by women, and first- and midlevel management positions are for 36.9% filled by women (Catalyst, 2017). Looking at the public sector, the division of female and male leaders differs across nations. Canada scores highest in equality with 45% of the leaders being female and the United States is 6th with 31% (EY, 2013). In the Netherlands, at least 30% of the top leading positions has to be filled by women (Rijksoverheid, 2017). These examples indicate that the division of women and men in a leading position is uneven in both private and public sectors. This inequality has economic and social drawbacks given that organizations with gender diverse leading positions perform better financially than when the positions are mainly filled by men, and that women actually want to fill leading positions, but are facing discriminatory factors (Eagly, 2007; Eagly & Carli, 2003). These factors increase chances of men receiving promotions and of women leaving their jobs, especially in male-dominated occupations. Also, having a gender diverse group of leaders results in higher firm performance due to reduced group thinking and increased creativity, innovation and problem solving (Kakabadse, et al., 2015). Meanwhile, findings of several studies on gender and leadership indicate that women are equally suited for leadership positions as men (Hoyt, 2010; Ayman, Korabik, & Morris, 2009; Reuvers, Van Engen, Vinkenburg, & Wilson-Evered, 2008; Archer, 2016; Hosie, 2017). Several studies on gender and leadership report that women are performing better in communication, ability to innovate, being supportive and setting goals, while men only score higher on dealing with stress and emotions. Besides, organizations with strong female leadership throughout the organization have a higher yearly return on equity than organizations without strong female leadership. Yet Pounder and Coleman (2002) mention several studies that found no differences in leadership due to gender, but mention also a few studies that found that female leaders are more transformational then their male counterparts. A difference in performance of male and female leaders could be caused by a difference in the display of nonverbal behavior of the leader (Cole, 2004). In the same study from Cole (2004) it is mentioned that women exhibited more frequently a positive demeanour than men, while also being more transformational than men. This demeanour consists of smiles, gestures to emphasize points being made, and positive expressions while talking and listening. This behavior supports leaders to come across as charismatic, which is a factor of transformational leadership (Awamleh & Gardner, 1999; Antonakis, Avolio, & Sivasubramaniam, 2003). Transformational leadership is seen as an effective leadership style (Lowe, Galen Kroeck, & Sivasubramaniam, 1996). Therefore, this study focuses on the relationship between nonverbal behavior and transformational leadership in order to find evidence that women are equally good or better leaders than men, which can then support the hiring and promotion of female managers in order to reduce the uneven gender division in leading positions in private and public sectors.

What makes a leader effective has been studied for many years now (Yukl, 1989), but a precise answer has not been found yet. Which is why this study focuses on nonverbal behavior in order to add another piece to the puzzle of effective leadership. Gender differences are currently gaining a lot of interest, but the methodology of these studies vary, causing different results based on the observation technique used, keeping the true answer unclear (Powell, 2011). Often, the nonverbal behavior differences or the different responses when women and men display the same nonverbal behavior are examined, but the influence on team effectiveness due to the specific nonverbal behavior is lacking research (Darioly & Schmid Mast, 2014; Henley, 1977; Hall, Smith LeBeau, & Coats, 2005). Leadership styles have received much attention in the last few years (Bass & Avolio, 1993). Different studies resulted in the Full-Range Leadership Theory (FRLT), consisting of three leadership styles being transformational, transactional, and laissez-faire leadership (Antonakis, Avolio, & Sivasubramaniam, 2003). With the use of Multifactor Leadership Questionnaire, the degree of the three leadership styles used by a leader can be measured (Avolio & Bass, 2004). The effectiveness of the three styles differ. Research has shown that the transformational leadership style is often the most effective style because the relationship between a transformational leader and it's supervisors and followers is often better than when the leader is transactional, resulting in more contribution to the organization from both the leader and the followers. (Lowe, Galen Kroeck, & Sivasubramaniam, 1996; Bass M. , 1990).

In most behavioral studies, the different observation techniques are 1) laboratory experiments recreating group meetings, 2) assessment studies comparing (business) students' behavior, and 3) organizational studies, where actual leaders are observed in their normal work environment (Powell, 2011). In the previous decade, the most often used research strategy was the organizational study (16%) (Gardner, Lowe, Moss, Mahoney, & Cogliser, 2010). This study also makes use of the organizational setting in order to research nonverbal behavior. Beside observation technique, most cross-sectional studies focusing on leader behavior use surveys to obtain data (64%), and let the followers fill in these surveys (Lowe & Gardner, 2000). For this study, not only followers, but also leaders and experts rate the performance and behavior of the leaders. Therefore, the results are checked for internal consistency and reliability due to 'within-method' triangulation (Jick, 1979). Also, the use of different methods (surveys and video observation) and sources (followers, leaders, and experts) lowers common source and methods bias (Podsakoff, MacKenzie, & Podsakoff, 2012). The combined answers to the survey provide a valid result of the phenomenon observed (Bouchard Jr., 1976). The survey results are used to determine the leadership style of the leader and the team effectiveness due to the leadership provided by the leader. To summarize, bias is lowered due to the use of different methods and sources, which causes this study to be more reliable and valid.

This study contributes to the current literature of leadership behavior and gender differences. First, it gives a clear picture how the average leader behaves nonverbally. Second, the results give an indication what nonverbal behaviors are supportive or counterproductive of transformational leadership. Third, the results provide clarity on the relationship between transformational leadership and follower trust. Fourth, the results support the equality of men and women as effective leaders.

This study is unique since it studies nonverbal behavior supporting transformational leadership, instead of focusing on the degree of leadership style only. Also, making a distinction between female and male nonverbal behavior in combination with transformational leadership and its effect on team effectiveness has not received much attention before.

1.1 The Present Study

The effect of nonverbal behavior displayed by leaders on team effectiveness is analyzed for this research. There is a distinction between female and male leaders in order to see whether there are differences in team effectiveness, leadership style, and overall display of nonverbal behavior due to gender effects. Gender has an influence on leadership style taken, with women

often being more transformational than men (Eagly & Johannesen-Schmidt, 2001). This difference in leadership style is often based on the perceptions of women and men, instead of the factual differences between women and men (Appelbaum, Audet, & Miller, 2003).

While female leaders are more often transformational as compared to men, they also display more positive nonverbal behavior, which consists of positive facial expressions, hand gestures, and paying attention to their surroundings (Cole, 2004). A transformational leadership style contributes positively to the effectiveness of the team (Özaralli, 2003), and it can even be viewed as a more feminine leadership style due to the behaviors it encompasses (Hoyt, 2010). Yet, the 'think manager – think male' phenomenon from Schein (1975) is still present, meaning that when asked, people will faster mention a man as opposed to a woman when asked who the best leader ever worked for is (Brands, 2015). Also, when describing a successful manager, a man, and a woman, the description of a man is more congruent with the manager's description than with the woman's description (Heilman, Block, Simon, & Martell, 1989). Transformational leadership influences team performance, but this is mediated by cognitive and affective trust (Schaubroeck, Peng, & Lam, 2011). The present study aims to provide a contribution to the literature supporting women as more effective leaders than men, and contradicts Schein's 'Think manager – think male' phenomenon.

The objective of this research is to find an answer to the following research question:

To what extent does the nonverbal behavior leaders display during team meetings mediate the relationship between leader gender and transformational leadership, and how do these variables relate to team effectiveness via follower trust?

The relationship proposed has the following direction:

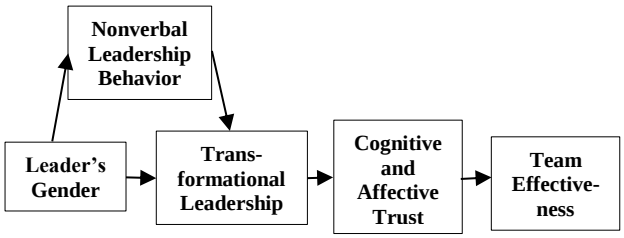

Figure 1. Conceptual model illustrating the proposed relationships between leader gender, nonverbal leader behavior, transformational leadership, trust and team effectiveness.

Figure 1 illustrates that leader gender has an effect on transformational leadership style taken by a leader and the nonverbal behavior displayed by a leader, with the leadership style having an influence on team effectiveness, but is moderated by cognitive and affective trust. Leader gender influences the mediated behaviors displayed.

2. LITERATURE REVIEW AND HYPOTHESES

2.1 Transformational Leadership and Leader Gender

According to Ridgeway and Smith-Lovin (1999), gender constitutes "…males and females as different in socially significant ways and justify inequality on the basis of that difference." (p.191). To show these differences, comparisons of competency are made between groups based on gender, not competency. As a result, an image is created that the group who has an advantage based on one comparison, has more valued skills overall (Webster & Foschi, 1988). Ridgeway also mentions that leadership is based on the actual behavior of the would-be leader, but also on the expected behavior that a leader should express. This expectation is socially constructed by stereotypes, and these stereotypes cause both groups to act differently when given a gender neutral or specific task. With a neutral task, men participate more then women. With a stereotypically male task, males' behavior exaggerates, while with a stereotypically female task, women participate more than men, but their behavior changes a little. Therefore, leader gender has an influence on perceived leadership effectiveness due to existing stereotypes.

2.1.1 Transformational leadership

Avolio and Bass (1991) introduced the 'Full Range Leadership Theory' (FRLT) consisting of three leadership typologies, being transformational, transactional, and nontransactional laissez-faire leadership. Transactional leadership is task and goal oriented, and nontransactional laissez-faire leadership represents the avoidance of decision-making, authority use and responsibility (Antonakis, Avolio, & Sivasubramaniam, 2003).

Transformational leadership consists of five factors, namely 1) idealized influence (attributed), 2) idealized influence (behavior), 3) inspirational motivation, 4) intellectual stimulation, and 5) individualized consideration. Idealized influence refers to the leader's socialized charisma and the charismatic actions. Bass (1985) found that followers describe their transformational leader as someone who treats them as equals, being fair and integer, and encourages them to perform higher than they thought they could. The transformational leader is formal and firm when needed, but is viewed by followers as informal and accessible. Bass (1985) describes charisma as "… one of the elements separating the ordinary manager from the true leader in organizational settings." (p. 34). Followers want to identify with their leader and are inspired by them. Idealized influence goes hand in hand with inspirational motivation. The charisma needed for the idealized influence has as aspect the ability to inspire. This inspirational motivation energizes followers to achieve higher than their previous expectations thought was possible and is a result of the leader's confidence in him/herself and the followers. Intellectual stimulation increases followers' awareness of problem solving and perspectives on problems. A transformational leader promotes followers' sense of logic and analysis and challenges them to think creatively. Individualized consideration represents that a leader does not focus on task completion, but on recognizing the individual needs of its followers and developing the potential to achieve higher over time (Avolio & Bass, 1995).

2.1.2 Individualized consideration

Individualized consideration mainly consists of providing feedback, which can be either positive or negative (Avolio & Bass, 1995). The result of giving feedback is developing the follower in order to learn from successes, but also mistakes, helping them change motives and shift their perceptions and interests from personal to group. This (leader) feedback is supported by the nonverbal cues given while delivering the feedback (Seppala, 2017). These cues consist of facial expressions (smiling or frowning), having eye contact while giving feedback, uncrossed arms, and paying attention. Individualized consideration is showed by providing support to efforts and encouraging autonomy and responsibility. When comparing transformational female and male leaders, the highest difference in one of the five factors is in their individual consideration, being higher for women than men (Eagly, Johannesen-Schmidt, & Van Engen, 2003).

2.1.3 Effectiveness of leadership styles

In a meta-analysis from Lowe, Galen Kroeck, & Sivasubramaniam (1996) transformational and transactional leaders and their effectiveness, as perceived by their sub-ordinates, are compared. The result is that transformational leadership is more highly associated with effectiveness than transactional leadership, based on the perception held by followers. Bass (1985) mentions that transactional leadership has limited effectiveness. Transformational leadership itself does not have a direct influence on team or organizational effectiveness, but is supportive of different factors resulting in higher effectivenss. Examples are team cohesion (Wu & Lu, 2012) and organizational culture (Mahalinga Shiva & Suar, 2012), which are supported by a transformational leader and results in higher effectiveness. Transformational leadership also increases job performance of a leader's followers with the mediation of cognitive and affective trust (Zhu, Newman, Miao, & Hooke, 2013). Leadership style and the effectiveness differ when looking at follower focus. When followers are promotion-focused, they perceive transformational leadership as more effective, while transactional leadership is more effective when they are prevention-focused (Hamstra, Van Yperen, Wisse, & Sassenberg, 2014).

Bass and Avolio (2004) state that "… prior evidence indicates that women leaders are more transformational than their male counterparts, accompanied by greater satisfaction and rated effectiveness" (p. 42) when rated by female and male followers. An earlier study by Maher (1997) it is stated that gender does not have an influence on leadership style taken, but that the stereotypes held for certain positions may play a role in the ratings. In a study by Eagly, Johannesen-Schmidt, & Van Engen (2003), men and women are compared on leadership style taken. The results of this study concluded that women are more transformational than men, except for one factor. Men score higher on idealized influence (behavior). As a result, transformational female leaders score more positive on effectiveness than transformational male leaders. A transactional and laissez-faire leadership style is seen as gender neutral and are used evenly by men and women (Stempel, Rigotti, & Mohr, 2015). This higher rating of women may be caused by the different stereotypes men and women hold, with women having to be modest and men having to be pragmatic and self-confident (Wolfram & Gratton, 2014). The studies from Bass & Avolio (2004) and Eagly et al. (2003) lead to the first hypothesis of this study.

Hypothesis 1:Female leaders score higher on transformational leadership compared to male leaders.

2.2 Nonverbal Leadership Behavior and Gender

Nonverbal behavior is a sum of cues given by someone to convey and support their opinion, but whether this comes across correctly depends on how the perceiver's decodes these cues (Bonaccio et al., 2016). The meaning of the cues is dependent of biological and cultural origins, e.g. gender.

Nonverbal behavior is categorized into three different codes, being body codes, sensory and contact codes, and spatiotemporal codes (Bonaccio et al. 2016). This study focuses body codes only, because these codes focus on the communication through movements of the body and face. These codes are divided into several categories, of which kinesics and oculesics are relevant, since kinesics focus on communication via the body and oculesics focus on communication via the eyes (Ekman & Friesen, 1969). Kinesics is divided into facial expressions and hand movements, while oculesics focuses on eye-gaze.

2.2.1 Eye-gaze

Gazing has three functions, namely monitoring, regulatory, and expressive functions (Kendon, 1967). The monitoring function is for observing the behavior of the interactant and derive information from this behavior. Women spend more time gazing than men in order to scan their interactant (Exline, 1963). Regulatory gazing deals with speaking turns and the switching of it. Expressive gazing supports the expressions of feelings. Nielsen (1964) mentions that looking at or away during listening or speaking all have different meanings. Looking away during listening indicates dissatisfaction, and during talking may indicate uncertainty. Looking at the interaction partner during listening indicates agreement, and during talking indicates interest and certainty. The level of gaze is often high in the beginning of a conversation in order to monitor the interactant(s), but decreases a little after a while (Abele, 1986).

2.2.2 Facial expressions

For this study, brow and mouth movements are analyzed as indicators of facial expressions (e.g., Ekman the studies). Mouth movements are categorized into smiling, neutral or having the lip corners down. In a study by Keating, Mazur, & Segall (1977) it is found that having a neutral face, or 'nonsmiling' is viewed as dominant. However, smiling has a positive influence on the perception people have on the person expressing the smile (Otta, Lira, Delevati, Cesar, & Pires, 1993). When taking leadership into account, it is better to have a neutral face or a broad smile than to have a closed or upper smile. A decade later, Schmid Mast and Hall (2004) found no relation between dominance and smiling. Women do smile more than men, but this is not related to their dominance.

Brow movements are divided into neutral, raised, lowered, and mixed eyebrows. When someone is nervous, eyebrows tend to be raised and pulled together (Trichas, Schyns, Lord, & Hall, 2017). When having to choose the most dominant face, a person chooses more often the face of someone with lowered eyebrows than with raised eyebrows (Keating, Mazur, & Segall, 1977). Yet, when looking at the actual dominance of a person, eyebrow movement has no effect (Hall, Smith LeBeau, & Coats, 2005). Meanwhile, lowered brows are employed in negative emotions, such as sadness or anger, while raised eyebrows indicate interest or surprise (Ekman, 2004).

2.2.3 Hand movements

Hand movements are categorized into self-touch, object-touch and gestures. Dominance is rated higher when a person is self-touching less, touching more of others and using more hand gestures (Hall, Smith LeBeau, & Coats, 2005). Individuals have a different favorite gesture and the frequency of display differs per person. Often, the frequency increases when someone is uncomfortable (Ekman, 2004). But it can also increase when someone is in a comfortable environment. Gestures help in retaining the listeners' attention, explaining what is being said and keeping the floor.

2.2.4 Nonverbal styles

There are four nonverbal styles, being social, submissive, dominant, and task (Carli, Loeber, & LaFleur, 1995). An overview of the nonverbal behaviors per style is found in table 1. The submissive style is the least effective in influencing. The social style causes the speaker to come across as friendly and likeable and is more effective for women than for men. The task style is effective in influencing, with likeability differing between the audience and speaker's gender. The dominant style is ineffective and undesirable.

Henley (1977) studied the effect of nonverbal behavior on power, status and dominance and states that the nonverbal behavior

Nonverbal style	Behavior
Social	Friendly facial expression Eye contact
Submissive	Nervous hand gestures Little eye contact
Dominant	Intrusive hand gestures Eye-contact while speaking Lowered eyebrows
Task	Calm gestures High amount of eye contact

Table 1. Nonverbal styles with corresponding nonverbal behaviors.

expressed more by women than by men is an indication of women's lower power. When both men and women display the nonverbal task style, women are considered as less likeable and influential, and more threatening (Carli, Loeber, & LaFleur, 1995). The dominant nonverbal style causes no difference in perceptions. When it comes to accurately decoding others' non-verbal behavior, women perform better than men (Hall, Smith LeBeau, & Coats, 2005). The nonverbal cues given by women are easier to read (Rosenthal & DePaulo, 1979). In a study on patient satisfaction, patients rated their physician more positively when their physician showed nonverbal behavior that is typical for his or her gender than when showing atypical behavior (Schmid Mast, Hall, Klöckner, & Choi, 2008). The actual differences in nonverbal behavior between men and women is that women act more with their faces and men more with their body (Schmid Mast & Sczesny, 2010). Women smile, gaze and nod more, and have a more accurate expression of their emotions. Men show more body movements and use more interpersonal space via body expansiveness, and make more use of their voice and style of speech. This difference in usage of nonverbal behavior leads to the following hypotheses.

Hypothesis 2a: Female leaders smile more than male leaders during regular staff meetings.

Hypothesis 2b: Female leaders move their eyebrows more than male leaders..

Hypothesis 2c: Female leaders spend more time looking towards their team than male leaders.

Hypothesis 2d: Female leaders display more self-touch than male leaders.

Hypothesis 2e: Female leaders use more gestures than male leaders.

2.2.5 Nonverbal behavior in transformational leadership

Leaders' behavior towards followers is influenced by the expectation held of the followers (Eden, 1990) . When a leader has high expectations of followers, these followers tend to increase performance, while when having low expectations, this performance decreases (Sutton & Woodman, 1989). Performing higher than thought possible is a result of motivational inspiration, a factor of transformational leadership. When comparing male and female leaders, nonverbal behavior expressed and the effect of it differs (Darioly & Schmid Mast, 2014). When men and women display equal nonverbal behavior, a difference of effectiveness is present. Women tend to smile more, look more often at the people they are interacting with, use more gestures, spend more time self-touching, and have a more expressive face than men (Schmid Mast & Sczesny, 2010), meaning that they portray their emotions with more intensity/visibility (Hoffmann, Kessler, Eppel, Rukavina, & Traue, 2010). Men are more likely to use their body and voice. These behaviors have a positive influence on charisma, which is a combination of two factors of transformational leadership (Awamleh & Gardner, 1999). Certain nonverbal behaviors point out the leadership style conveyed. For example, transformational leadership is expressed with more facial expressions, frequent use of dynamic hand and body gestures and keeping eye contact with the people interacting with (Darioly & Schmid Mast, 2014). Overall, the use of gestures, eye contact and facial expressions leads to a better perception of a leader than when having a neutral face, avoiding eye contact and staying still. This leads to the following hypothesis.

Hypothesis 3: Leaders who score relatively high on transformational leadership show more frequent positive facial expressions, more and longer smiling behavior, and look towards their team members more often during staff meetings than leaders who score relatively low on transformational leadership.

2.3 Transformational Leadership, Trust and Team Effectiveness

According to McAllister (1995), interpersonal trust is defined as "… the extent to which a person is confident in, and willing to act on the basis of, the words, actions, and decisions of another." (p. 25). The confidence is the result of someone's previously demonstrated reliability and competence which makes it cognitive trust, as opposed to affective trust which is the result of social interactions (Ng & Chua, 2006).

2.3.1 Trust in transformational leadership

Transformational leadership is found to have a positive influence on team effectiveness (Choi, Kim, & Kang, 2017). This positive relationship is mediated by cognitive and affective trust in the leader (Schaubroeck, Peng, & Lam, 2011).

Affective trust is increased by strengthening the bond between the leader and the followers. A leader's behavior gives an example to the followers how to behave and shows willingness to put group goals over personal goals (Zhu, Newman, Miao, & Hooke, 2013). Transformational leadership supports affective trust between leaders and followers and results in higher job performance, organizational commitment and organizational citizenship behavior. The leader's motivation and energizing of positive work behavior is supported by affective trust (Yang & Mossholder, 2010). By paying attention to followers and communicating one-to-one with them, leaders convey interest and concern for the followers, which the followers then translate into care and consideration, strengthening the emotional bond between them. High affective trust results in higher job satisfaction, which in turn influences team effectiveness positively (Zhu & Akhtar, 2014).

Next, cognitive trust is influenced by charisma, since trans-formational leaders use their charisma to convince their followers to trust in their potential (Bass, 1985). This trust is not necessarily the result of social interactions with the leader, making this cognitive (Zhu & Akhtar, 2014) as opposed to affective. Another factor of transformational leadership, inspirational motivation, results in higher cognitive trust. Transformational leaders have to demonstrate their competence and reliability in order to convey their confidence in the followers and convince them. High cognitive trust in the leader causes team members to have a higher general belief in the capabilities of the team. This belief, called team potency, motivates the team to perform highly (Özaralli, 2003). The results of the study by Zhu & Akhtar showed a positive relationship between trans-formational leadership and cognitive trust. An older study by Dirks and Ferrin (2002) already reported a strong, positive

association between trust in a leader and transformational leadership. Therefore, the following hypothesis is proposed.

Hypothesis 4a: Teams with a highly transformational leader have more cognitive and affective trust in their leader than teams with a less transformational leader.

2.3.2 Team effectiveness

Team effectiveness is categorized into three dimensions with 1) performance effectiveness, 2) member attitudes, and 3) behavioral outcomes (Cohen & Bailey, 1997). Performance effectiveness includes productivity, outcomes or innovation. Member attitudes include employee satisfaction or trust. Behavioral measures include absenteeism and turnover. Gibson et al. (2009) looked at team effectiveness by asking team leaders, members and third-parties to rate the performance of the team. Cohen & Bailey (1997) mention leader behavior as an aspect that influences team effectiveness, with trust in the leader and decision quality of the leader as mediators.

2.3.3 Effect of trust on team effectiveness

Affective trust in the leader supports the job satisfaction of followers, which is in turn related to team effectiveness (Zhu & Akhtar, 2014; Özaralli, 2003). Affective trust in transformational leadership results into positive work outcomes (Zhu, Newman, Miao, & Hooke, 2013). Hui-min & Li-rong (2008) found that cognitive trust positively affects team performance. This effectiveness is directly caused by trust, but also mediated via organizational citizenship behavior (Mayer & Gavin, 2005). Cognitive trust facilitates followers' helping behavior, making them more helpful towards others when followers trust their leaders (Zhu & Akhtar, 2014). Besides, followers with high levels of cognitive trust are more likely to put extra effort into their tasks, causing them to exhibit higher levels of task performance (Zhu & Akhtar, 2014). Overall, it can be stated that cognitive and affective trust in the leader has a positive effect on team performance (Hui-min & Li-rong, 2008). This leads to the following hypothesis.

Hypothesis 4b: Teams that show higher levels of cognitive and affective trust in their team-leaders work more effectively compared to teams that show lover levels of cognitive and affective trust in their team leaders.

3. METHODOLOGY

The data used in this research is retrieved from two different sources with different methods. The first source is the answers given to surveys, which is the first method. Three surveys are made for and filled in by leaders, followers and experts. The second source is the data from coded videos. All leaders are filmed while leading a meeting with their followers. The nonverbal behaviors expressed by the leaders during this meeting are coded with the use of a pre-defined codebook. The behaviors are coded based on duration, frequency and sort.

Both sources come from different methods, which is a form of methods triangulation. This increases the internal validity of the research (Johnson, 1997). The methods used are surveys and observation.

3.1 Sampling

The sample used for this research consists of 45 middle management leaders and 488 followers. 49 followers did not (completely) fill in their survey and are therefore excluded from the research. Hence, the final sample consists of all 45 leaders and 439 followers. All participants work for the same large, Dutch, national, public organization.

The leaders of the sample have an average age of 50 years, the youngest being 27 and the oldest 64 years and consists of 35 male leaders and 10 female leaders. The average level of education is a Bachelor's Degree, and varies between Community college and a PhD. Overall, the leaders have an average of 13 years fulfilling a function as a leader, with the least experience being 1 year, the most experience being 32 years. The characteristics of the male and female subgroup can be found in Appendix 1.

All leaders are filmed during a standard meeting. After these meetings, all followers fill in a survey. There are 439 followers, of which 296 (67.43%) are male and 143 (32.57%) are female. The average age of these followers is 50 years. The followers have been working within the organization for an average of 25.0 years. The average time working within the current team is 3.5 years.

3.2 Data Collection and Measures

3.2.1 Video data

The leaders are filmed during 45 standard meetings. These meetings are selected at random. At every meeting, three cameras are placed in the room. One camera is directly filming the leader, the other two cameras are both filming a different half of the followers. The cameras are placed before the participants enter the room and are not moved, adjusted or removed during the meeting. According to Mead (1995), the cameras will blend into the background when not brought to attention and participants will continue their behavior as normal (Collier & Collier, 1986). Recording the participants with unmoved cameras instead of having researchers taking field notes is less obtrusive, causing the reactivity to be lower and participants to behave as normal (Kent & Foster, 1977). Therefore, it is assumed that filming the participants results in minimal bias. In order to check this, followers are asked to answer questions about their own and their leader's behavior by filling in a survey right after the meeting. The question based on the leader's behavior during the meeting is 'How different from normal was your leader's behavior during the filmed meeting (relative to a non-filmed meeting)?'. The possible answers given to the question are based on a seven point Likert-Scale, 1 being 'completely different' and 7 being 'not different at all'. 429 followers filled in this question, with an average of 5.75 out of 7. This average shows that the behavior of leaders during a filmed meeting is not different from a standard meeting.

All 45 videos are analysed for thirty minutes, starting the analysis and coding when the meeting starts. The behaviors are analysed and coded with the software 'The Observer XT' (Noldus et al., 2000). With the Observer XT, videos can be played back, forward, faster, slower and paused. Videos can also be watched frame-by-frame. The behaviors coded are based on the codebook summarized in Appendix 2. This codebook is developed by Jacco G.W.L. Smits and is based on previous studies, which can be found in table 2. Data obtained from the Observer XT provides the category, frequency and duration of the behaviors. The categories of behaviors are hand movements, eye-gaze, mouth movements, and eyebrow movements. Frequency of the behaviors are the amounts that certain behaviors are expressed. Duration is the length of each nonverbal behavior expressed. The frequency and duration of the analysed behaviors are converted to percentages. The frequency and duration total up to 100% of the expressed behaviors of a leader.

All videos are analysed and coded by thoroughly trained graduate and undergradute students of the University of Twente, and they participated in a short workshop on how to use the software of the Observer XT and how to interpret the codebook. All videos are coded on the same behavior by two different students. The students code a video apart from each other, then compare and discuss the results. The hand movements and facial expressions have a Kappa of 0.72 and an agreement rate of 90.19% and 77.20% respectively. Eye-gaze has a Kappa of 0.44 and an

Behavior	Categories	Sources
Hand movements	Object touch Self-touch: head area Self-touch: other	Ekman & Friesen, 1969; Maricchiolo, Gnisci, & Bonaiuto, 2012
Eye-gaze	Looking towards group Looking away from group Functional looking	Montague, Xu, Chen, Asan, & Barrett, 2011
Mouth movements	No mouth movement Open smile Closed smile Having lip corners down	Otta, Lira, Delevati, Cesar, & Pires, 1993
Eyebrow movements	Raising eyebrows Lowered eyebrows Mixed eyebrows No eyebrow movement	Ekman, 2004

Table 2. Coded behaviors with sources.

agreement rate of 60.19%. An overview of the agreements and Kappa's can be found in Appendix 3**.** After the two coders finish their coding and discussing of the results of all videos, a third student checks the codings to see if behaviors are coded that are not expressed or to code missing behaviors. The use of multiple observers is called investigator triangulation and increases the descriptive validity of the study, which is the accuracy of behavior reporting (Johnson, 1997).

After all videos are fininshed with coding, the thirty minutes coded are checked whether the leader and followers are still interacting meeting related. When a meeting is interrupted by, for example, coffee breaks or powerpoint presentations, these momentes are labeled as null-behavior and is afterwards deleted from the dataset. Therefore, some codings of leaders do not total up to 1800 seconds. In order to compare leaders accurately, all nonverbal behaviors are standardized in order to have 1800 seconds of coded behaviors per leader and team meeting.

3.2.2 Follower surveys

The leadership style and effectiveness is rated by the followers with the use of a survey. Part of this survey is based on the Multifactor Leadership Questionnaire created by Avolio & Bass (2004). The followers are asked to rate their team effectiveness. This is done with four different items, being 1) 'This team is effective', 2) 'This team makes few mistakes', 3) 'This team is a high performing team', and 4) 'This team does high quality work'. The followers rate these items on a seven point Likert-Scale, ranging from 'completely disagree' (1) to 'completely agree' (7). To measure transformational leadership, four questions per factor are asked. In total, 20 different questions give an indication of the degree of transformational leadership that a leader shows. In order to measure the levels of trust in a leader, six survey items measure the level of cognitive trust and five survey items measure the level of affective trust. The cognitive trust items are 1) 'This person approaches his/her job with professionalism and dedication', 2) 'Given this person's track record, I see no reason to doubt his/her competence and preparation for the job', 3) 'I can rely on this person not to make my job more difficult by careless work', 4) 'Most people, even those who aren't close friends of this individual, trust and respect him/her as a coworker', 5) 'Other work associates of mine who must interact with this individual consider him/her to be trustworthy', and 6) 'If people knew more about this individual and his/her background, they would be more concerned and monitor his/her performance more closely'. The affective trust items are 1) 'We can both freely share our ideas, feelings, and hopes', 2) 'I can talk freely to this individual about difficulties I am having at work and know that (s)he will want to listen', 3) 'We would both feel a sense of loss if one of us was transferred and we could no longer work together', 4) 'If I shared my problems with this person, I know (s)he would respond constructively and caringly', 5) 'I would have to say that we have both made considerable emotional investments in our working relation'. These items are also rated on a seven point Likert-Scale. The items are created based on the study from McAllister (1995).

3.2.3 Leader surveys

Leaders are asked to fill in a survey about their followers, their team and themselves. This survey is also based on the MLQ from Avolio and Bass (2004). The leaders receive the same question about their team effectiveness as the followers, on the same seven point Likert-Scale.

3.3 Codebook with Behaviors

The nonverbal behaviors displayed by leaders is coded with the use of a pre-defined codebook. Hand, mouth and eyebrow movements and eye-gaze are the behaviors used for this study. For an overview of the behaviors and sources, look at table 2.

3.3.1 Hand movements

Touching - Three categories of touching are created. Object-touching is described as 'one hand or both hands actively touch objects in the physical space'. An example is fiddling with a pen or ring. Next, there is self-touching in the head area. This is coded when one or both hands are actively touching the head area, for example hair or face. Last, self-touching of other bodily areas is coded, for example the arms or legs.

Illustrative gestures - Illustrative gestures are described as an 'illustrative movement of one or both hands during speech'. These gestures are divided into five classes. 1) upward palm orientation, which happens when the speaker holds both palms upward in an open manner when talking, 2) downward/inward palm orientation, displayed when the speaker holds his/her palms downward or when the palms are not visible for the audience, 3) mixed palm orientation, which means the palms are neither both upward or downward oriented, 4) clasped hands, which is shown when a leader is holding or clasping his/her own hands in a resting position, and 5) no gestures, which happens when the four before mentioned gestures are not displayed or when the hands are not visible.

3.3.2 Eye-gaze

The gaze of the leader is coded into three different behaviors that can be shown. The first is looking towards the group, meaning the leader has his/her gaze focused on (one of) the followers. Second, a leader can look away from the group. Examples are looking at the ground or the ceiling. Lastly, a leader can display functional looking, which is described as 'looking at working-related materials or objects in the room with the intent to use them'. An example is looking at a notebook to write down information.

3.3.3 Mouth movements

A leader's mouth movements are coded into four possible options. The first is 'no mouth movement'. This is coded when the leader displays his/her neutral resting face or when the leader talks without showing one of the other possible movements. The second movement is the display of an open smile. This has the description of 'the mouth corners are drawn up and out, and the upper lip is raised showing parts or all of the teeth'. Next, a leader can show a closed smile. All teeth remain covered by the lips, but the mouth corners are still drawn up. The last movement is having the lip corners down. This can be combined with stiffening or pressing the lips.

3.3.4 Eyebrow movements

The eyebrows of a leader are coded into four different categories. Raising eyebrows is coded when a leader lifts both eyebrows upward. Lowered eyebrows is described as 'both eyebrows contract and move towards the nose'. Next, there is mixed eyebrows, which is coded when one eyebrow makes a different move than the other eyebrow. Lastly, no eyebrow movement is coded when the leader does not display one of the previous behaviors.

4. RESULTS

Nonverbal behavior	**Frequency**		**Duration**	
	Male Leaders	Female Leaders	Male Leaders	Female Leaders
Object touch	36.9%	33.3%	13.7%	14.5%
Self-touch: head area	32.6%	40.7%	7.9%	10.7%
Self-touch: body	30.5%	26.0%	7.2%	12.8%
No touching coded			71.2%	62.0%
Total	100%	100%	100%	100%
Looking towards group	48.9%	49.6%	77.9%	78.2%
Looking away from group	34.0%	24.1%	9.1%	5.1%
Functional looking	17.1%	26.3%	13.0%	16.7%
Total	100%	100%	100%	100%
No mouth movement	48.4%	47.4%	95.7%	93.3%
Open smile	22.1%	31.3%	2.1%	4.8%
Closed smile	13.9%	15.3%	1.0%	1.5%
Lip corners down	15.6%	6.0%	1.2%	0.4%
Total	100%	100%	100%	100%
No eyebrow movement	49.3%	49.8%	90.4%	95.3%
Raised eyebrows	40.2%	40.5%	7.1%	3.3%
Lowered eyebrows	9.5%	6.5%	2.2%	1.0%
Mixed eyebrows	1.0%	3.2%	0.3%	0.4%
Total	100%	100%	100%	100%
No gesture	31.6%	28.8%	62.0%	66.5%
Upward palms	8.7%	13.5%	2.1%	3.0%
Downward palms	17.2%	18.5%	6.3%	4.7%
Mixed palms	22.4%	20.4%	6.2%	3.9%
Clasped hands	20.1%	18.8%	23.4%	21.9%
Total	100%	100%	100%	100%

Table 3. Frequency and duration of nonverbal behaviors in % (N=35 male, N=10 female).

Variables	M	SD	1	2	3
1. Gender	1.22	.420			
2. Transform. leadership	5.32	.438	.237		
3. Trust	5.66	.463	.241	.882**	
4. Team effectiveness	5.00	.499	.112	.407**	.454**

**** = P > 0.01 level (1-tailed).**

Table 4. Correlation among the key variables.

In table 3, an overview is shown with the frequencies and durations of all nonverbal behaviors per category. Behaviors with the highest frequency beside the standard behaviors are object touch for men and self-touch of the head area for women, looking away for men and functional looking for women, open smile, raised eyebrows, and mixed palms for both. The longest duration behaviors are object touch, functional looking, an open smile, raised eyebrows, and clasped hands. The longest durations do not differ between men and women.

Table 4 shows the correlation among the four variables studied. It shows that gender has no significant correlation with one of these variables. However, transformational leadership correlates significantly with trust and team effectiveness. Trust correlates with team effectiveness as well.

An independent t-test is done in order to compare the level of transformational leadership between men and women. Women's level of transformational leadership (M=5.51; SD=0.411) has the result of $t(15)$=-1.654 and a p-value of p=0.119. This means that the difference is not significant. Therefore, H1 is rejected. When comparing the different factors of transformational leadership and gender, no significant difference is found. When dividing the scores of transformational leadership into three categories (low, middle, high) of 15 leaders per category, low transformational leadership has an average score of 4.83; middle of 5.33; and high of 5.80 with a minimum of 5.61 and maximum of 6.11. When comparing the rank of transformational leadership with gender, no significant difference is present. Appendix 6 shows an overview of the results of the five factors and the rank of transformational leadership. Thus, H1is rejected, also when performing t-tests on the five transformational factors individually.

By performing an independent t-test, six nonverbal behaviors, depending on duration or frequency, are significantly different for women when compared with men. For frequency, this is functional looking (M=70.1; SD=36.67), an open (M=23.6; SD=16.60) and a closed smile (M=11.5; SD=7.15). These behaviors are significant with $t(42)$=-2.413; p=0.020; $t(10)$=-2.431; p=0.035; and $t(39)$=-2.345; p=0.024 respectively. For duration, the behaviors looking away from group, lip corners down and raised eyebrows differ significantly. Looking away (M=91.4; SD=52.99) has as result $t(36)$=2.657 with p=0.012; lip corners down (M=7.9; SD=6.87) has $t(36)$=2.378 and p=0.023; and raised eyebrows (M=59.0; SD=35.2) has the result of $t(39)$=3.562 and p=0.001. Due to the significance in frequency of both smiling behaviors, there is enough evidence to conclude that women smile more than men. Therefore, H2a is accepted. The duration of raised eyebrows was significantly different between men and women, but with men raising their eyebrows longer. Therefore, H2b is rejected. There is no significant difference in looking towards the team between the genders. Therefore, H2c is rejected. The hand movement behaviors have zero significant differences in duration and frequencies between men and women. Therefore, H2d and H2e are both rejected. An overview of the results of the behaviors that do not differ significantly can be found in Appendix 5.

In Appendix 4, correlation tables of gender, transformational leadership and nonverbal behaviors can be found. A few of the nonverbal behaviors in combination with transformational leadership correlate significantly. The positive nonverbal behaviors tested with an independent t-test for accepting or rejecting H3 are raised eyebrows, open and closed smile, and looking towards the team. The frequency and duration of the behaviors in combination with high transformational leadership (>=5.61) have the following results. Only the duration of looking towards (M=1502, SD=169.9) and the duration of a closed smile (M=12.7; SD=11.0) are significant with $t(42) = 2.116$, $p = 0.04$ and $t(39) = -1.696$, $p = 0.041$ respectively. The result of the

closed smile behavior has a different result than expected, with leaders being highly transformational showing a closed smile significantly less than less transformational leaders. One of eight behaviors tested is in accordance with H3. Therefore, there is not enough evidence to accept that positive nonverbal behaviors support a transformational leadership style and leads to H3 being rejected. An overview of the results of the other 6 behaviors is summarized in Appendix 5.

The possible relationship between transformational leadership and trust is tested with an independent t-test and a regression analysis. Highly transformational leaders (M=6.1; SD=0.23) differ significantly from lower transformational leaders (M=5.5; SD=0.41) with a result of $t(41)=6.390$; $p>0.001$. The regression analysis states that 77.9% of the variance in trust is explained by transformational leadership ($R^2=0.779$; $F(1)=151.2$), $p>0.01$; $\beta=0.882$). This significance supports H4a, which is therefore accepted. Teams with a highly transformational leader have more trust in their leader than leaders with lower levels of transformational leadership.

The relationship between trust and team effectiveness is tested with another independent t-test and regression analysis. Trust is categorized into low, middle and high levels with a mean of 5.21; 5.83; and 6.11 respectively. The high level has a minimum of 5.96 and a maximum of 6.11. The t-test finds no significance when comparing high levels of trust (M=5.22; SD=0.334), with a result of $t(43)=1.574$ and $p=0.123$. A regression analysis states that 20.6% of the variance of team effectiveness can be explained by trust ($R^2=0.206$; $F(1)=11.18$; $\beta=0.454$) with $p=0.002$. The difference in significance is the result of the tests. The t-test compares the means of teams with high trust and lower trust. The difference in means is not significant. The regression analysis indicates that trust is a significant predictor of the outcome of team effectiveness. Two different tests give two different results. Therefore, H4b is rejected due to mixed evidence.

To summarize, female leaders do not score higher on transformational leadership than male leaders. Women do smile more than men, but men raise their eyebrows longer. Women do not look more at their team than men. Also, women do not self-touch more often and do not use more gestures than men. Next, highly transformational leaders do not exhibit more positive facial expressions, longer smiling behavior or spend more time looking at their team than less transformational leaders. Yet, teams with highly transformational leaders do have more cognitive and affective trust in their leader than when teams have less transformational leaders. Teams with high levels of trust in their leader do not work more effectively than teams with lower levels of trust.

5. DISCUSSION

Female leaders do not score higher on transformational leadership when compared with male leaders. No significant difference in transformational leadership and gender is found. This result contradicts the findings of Eagly et al. (2003) who found that women are more transformational than men, as mentioned in the literature review. This result is supported by an older study from Carless (1998), who found that subordinates of leaders do not observe differences in trans-formational leadership between women and men. A later study also confirms these findings and mentions that transformational leadership can be seen as a more androgynous leadership style (Manning, 2002).

Women smile more than men. The mean differences are significant and this result is supported by findings in other studies (Halberstadt, Hayes, & Pike, 1988; LaFrance & Hecht, 2000). Men raise their eyebrows more than women. This difference is significant and contradicts the expected result, which is that women raise their eyebrows more than men. This result does not correspond with existing literature. Hess et al. (2009) states that raising eyebrows is marked as feminine rather than masculine. An earlier study mentions that women raise their eyebrows signficantly more than men (Hall, Smith LeBeau, Reinoso, & Thayer, 2001). Women do not spend more time looking towards their group than men. No significant differences are found in gazing behavior, which is in line with the results mentioned in a study fom Hall and Friedman (1999). Whether women self-touch more than men is tested. The result is insignificant. This insignificance corresponds with the results from the meta-analysis from Hall et al. (2005) who also found no gender effects for self-touching behavior. Next, differences between men and women in usage of gestures is tested. The result of this is also insignificant. While in this study no difference is found in hand gesture usage between men and women, Hall et al. (2005) does mention than women use more gestures than men, which causes the result not to match the exising literature.

The relationship between high transformational leadership and postive nonverbal behaviors is tested. Four behaviors are tested on both duration and frequency. Of these behaviors, two are significantly different when compared with high and low transformational leadership. The signifcant behaviors are looking towards the team, and a closed smile, with a closed smile being contradictive of transformational leadership. Maintaining eye contact with the group as a supportive behavior of trans-formational leadership is in line with the findings of Garder (2003), who found that increased eye contact causes a message to come across as stronger. Yet, the smiling behavior is contradictive of most literature. Garder also found that smiling to interactants has a positive influence on the delivery of a message. Yet, Otta et al. (1993) state that the sort of smiling is important and that a closed smile causes leadership to be rated lower than when showing a neutral face. Otta and collegues also found that an open or broad smile receives significantly higher ratings of leadership, which contradicts the insignificance of the results of an open smile on transformational leadership. Raised eyebrows is not a significant behavior for indicating transformational leadership, while this behavior is considered to influence the responses of followers in a positive way (Darioly & Schmid Mast, 2014). Therefore, the result of the this brow movement is not in accordance with the existing literature.

The relationship between transformational leadership and trust in a leaders is tested. The results of the tests are significant, which means that transformational leadership can be seen as a predictor of trust in a leader. This result is supported by a study from Wang et al. (2016), who looked at the relationship between trans-formational leadership, trust and feedback seeking. Next, whether trust has an influence on team effectiveness is tested and has an insignificant result. This is contradictory of existing literature, for example the study of Mach and Lvina (2017) who found that that trust in the leader has a positive overall influence on team effectiveness, but is mediated by intra team trust. It could be possible that trust does not directly predict team effectiveness, but is indeed mediated by another variable.

Overall, when taking previously stated arguments into consideration, it can be said that the nonverbal behaviors leaders display during staff meetings does not mediate the relationship between leader gender, transformational leadership, trust and eventually team effectiveness. A few of the linkages in this relationship are missing support, with the result that the relationship as a whole is not supported. The relationship between transformational leadership and trust is the only linkage which is supported.

5.1 Practical implications

This research can be used for training purposes for existing leaders. Leaders can be assessed on their nonverbal behavior and their current level of transformational leadership. After this assessment, a personalized training can be provided in order to stimulate behaviors that support transformational leadership and discourage behaviors that decrease the level of this leadership style.

Next, this study can be used in the hiring and promotion processes of organizations. When hiring a new person for a leadership position in the company, it will be good to (quickly) analyze the nonverbal behavior of this applicant and use this as an indication for expected level of transformational leadership in order to hire the best future leader. Also when promoting existing employees to a leadership position, the nonverbal behavior shown by the candidates give an indication of leadership style, which can help in making a final decision on who should get promoted.

Last, the results of this study show that female leaders are equally transformational and effective as their male counterparts. This can be taken into account when hiring or promoting someone for a leadership position. When two candidates are equal based on level and years of experience and previously obtained results, a decision should not be made based on the gender of the candidate. Giving men and women equal chance of getting the position, the unequal gender division should eventually decrease.

5.2 Strengths, Limitations, and Future Research Directions

The strengths of the study are in the collection and combination of data from different sources, namely video observation and surveys. Data from two different sources reduce the common method bias. The videos are objectively observed and coded. The coders do not personally know any of the leaders that are coded. The surveys filled in by followers has as a strength that it gives a good insight in the perception followers have of their leaders.

The study has several limitations. First, the sample size is relatively small, consisting of only 45 leaders. The subgroups are even smaller and the female subgroup consists of 10 leaders, which gives a margin of error of 31.6%. This means that the results do not represent 31.6% of the population (Dooley, 2009). Second, the observed leaders all work within one highly hierarchical, public organization. This reduces the generalizability of the study when comparing public and private organizations, since the effectiveness of leader behavior differs between public and private organizations (Hooijberg & Choi, 2001). Third, the generalizability is also lower when comparing organizations worldwide. The Netherlands is characterized as an individualistic, long term oriented, and indulgent country (Hofstede, 2017). Therefore, the study cannot be compared to other countries, especially when these countries differ completely in characteristics. Next, the data is obtained only once. Therefore, it is not certain that an adaption in nonverbal behavior actually influences the degree of transformational leadership. Also, the video data is obtrusively collected, meaning that the leaders and followers are aware that they are being filmed. This awareness could cause a difference in behavior, making the data less valid (Dooley, 2009). In order to see the effect of reactivity, the follower surveys contain items that give an indication of the actual reactivity, which turned out to be low.

For further research on the possible effect of nonverbal behavior on leadership, it is recommended to perform a longitudinal study. This in order to be certain that nonverbal behavior does or does not play a role in leadership. First, train the current sample of leaders to show the behaviors that test significantly when compared between high and low transformational leaders. For example, train leaders to show less closed smiles and to spend more time looking at their team. After this training, nonverbal leader behavior has to be coded again in order to notice whether a change in behavior has occurred and surveys have to be filled in again in order to see whether the possible change in behavior influences the perceived level of transformational leadership. Since men and women behave in different ways, the training has to be adapted for both genders in order to be effective (Schmid Mast & Sczesny, 2010). Expressed nonverbal behavior has to be in line with assigned gender in order to be rated positively (Schmid Mast, Hall, Klöckner, & Choi, 2008). Looking more specifically at the five factors of transformational leadership in combination with certain nonverbal behaviors can help in understanding what nonverbal behaviors support or discourage transformational leadership. For example, repeat the tests done for H3, but instead of looking at transformational leadership as a whole, perform an independent t-test for high or low individual consideration in combination with nonverbal behaviors. This in order to see whether this factor is or is not affected more by nonverbal behavior than transformational leadership as a whole. After performing this test for all factors, it should be clear what factor(s) is/are affected by nonverbal behavior. Again, a training of supportive nonverbal behaviors has to be held for leaders. After this training, leaders have to be coded on nonverbal behavior again and followers will have to fill out surveys concerning their leader's behavior again. This in order to see whether the factors that are possibly affected by nonverbal behaviors are rated higher and whether this has an overall influence on transformational leadership.

Also, it is recommended to repeat the study with a larger sample, especially with more females in the sample to reduce the margin of error. A larger sample, and lower margin of error, leads to a more precise representation of the population, and therefore gives more precise results (Dooley, 2009). In order to find out to what degree the results are generalizable, it is recommended to perform the study in different industries, sectors, and countries. To get a more complete picture on team effectiveness influenced by overall behavior, body orientation can be added to the codebook again, while also looking at the verbal behaviors a leader shows. It is recommended to study nonverbal behavior in combination with transactional leadership in order to see what nonverbal behavior supports this style and to make a distinction between nonverbal transactional and nonverbal transformational behavior.

6. CONCLUSION

This study looks at the effect of leader gender on team effectiveness. The linkages in this overall interaction consist of nonverbal behavior, transformational leadership and trust. Women behave differently than men in terms of their nonverbal behavior, namely more functional looking, open and closed smiles, and shorter time is spent looking away, having the lip corners down or eyebrows raised. Transformational leadership results in higher follower trust. Also, the combination of transformational leadership and nonverbal behavior is interesting, since positively viewed behavior can either support or discourage transformational leadership. Examples are looking towards the team which is supportive, and displaying a closed smile, which is discouraging. This study is a good foundation for further research in the nonverbal behavior and transformational leadership interaction. Lastly, this study indicates that more research is still needed for transformational leadership and how leaders can become more transformational.

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9. APPENDIX

9.1 Characteristics of leaders and followers

Table 1a. Characteristics of all leaders.

		Min.	Mean	Max.	Count
Age		27	50	64	
Highest finished educational degree	**LBO**				0
	MBO				8
	HBO				13
	BSc				0
	MSc				21
	PhD				1
Years as a leader		1	13	32	

Table 1b. Characteristics of male leaders.

		Min.	Mean	Max.	Count
Age		34	52	64	
Highest finished educational degree	**LBO**				0
	MBO				7
	HBO				11
	BSc				0
	MSc				15
	PhD				1
Years as a leader		2	15	32	

Table 1c. Characteristics of female leaders.

		Min.	Mean	Max.	Count
Age		27	44	55	
Highest finished educational degree	**LBO**				0
	MBO				1
	HBO				2
	BSc				0
	MSc				6
	PhD				0
Years as a leader		1	7	12	

Table 1d. Characteristics of followers.

	Male		**Female**		**Total**	
	Count	Mean	Count	Mean	Count	Mean
Total	296		143		439	
Age		51		46		50
Years at organization		27.9		18.9		25.0
Years in team		3.7		2.9		3.5

9.2 Codebook for nonverbal behaviors

Table 2. Summary and overview of the codebook used for coding nonverbal behavior of leaders during a team meeting.

	Behavior	Definition
Hand movements		
1	Object-touching	One hand or both hands actively touch objects in the physical space.
2	Self-touching: head area	One or both hands actively touch a part of one's own body.
3	Self-touching: other bodily areas	One or both hands actively touch a part of one's own body.
4.1	Illustrative gestures: no gestures	The leader does not display any illustrative gestures or the hands are not visible.
4.2	Illustrative gestures: upward palm orientation	The hand palms are oriented upwards and are visible to other team members.
4.3	Illustrative gestures: downward/inward palm orientation	The hand palms are oriented downwards or inwards and are not visible to others.
4.4	Illustrative gestures: mixed palm orientation	The palms are not evidently upward or downward faced.
4.5	Illustrative gestures: clasped hands	The leader is clasping or holding their own hands in a resting position.
Eye-gaze		
5	Looking towards group	Looking towards the group or individual followers.
6	Looking away from group	Looking away from the group or individual followers.
7	Functional looking behavior	Looking at work-related materials or objects in the room with the intent to use them.
Mouth movements		
8	No mouth movements	A leader dos not visibly display any mouth or lip movements.
9	Open smile	The mouth moves so that its corners are drawn up and out, and the upper lip is raised showing parts or all of the teeth.
10	Closed smile	The mouth moves so that its corners are slightly drawn up and outwards, while the teeth remain covered by the lips.
11	Lip corners down	The mouth moves so that its corners are lowered downwards, while the lips cover the teeth.
Eyebrow movements		
12	No eyebrow movement	The leader does not visibly display any form of eyebrow movement.
13	Raised eyebrows	Both eyebrows are lifted upwards.
14	Lowered eyebrows	Both eyebrows contract and move towards the nose.
15	Mixed eyebrow movements	One eyebrow is lifted, and the other is lowered.

9.3 Kappa and agreement rates

Table 3. Average Kappa and interrater Agreement scores.

Category	Kappa	Agreement (in %)	Number of coders
Hand movements	0.72	90.19	5
Eye-gaze	0.44	60.19	6
Facial expressions	0.72	77.20	4

9.4 Correlation tables between gender, transformational leadership and nonverbal behavior

Table 4a. Correlation gender, transformational leadership, nonverbal behavior frequencies.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 gender	1.22	0.420																				
2 trans-formational leadership	5.32	0.438	.237																			
3 object touch	22.28	22.854	.025	-.087																		
4 self-touch head area	21.46	14.637	**.268***	-.053	-.042																	
5 self-touch other areas	18.18	13.756	.002	.018	.002	.109																
6 looking towards group	122.33	42.636	.122	-.199	.032	.203	.232															
7 looking away from group	78.90	38.056	-.212	-.098	.105	.018	.198	.682**														
8 functional looking	48.14	34.444	**.349***	-.135	-.141	.226	.083	.584**	-.136													
9 no mouth movement	25.81	12.196	**.444****	.064	.108	.254*	.287*	.122	-.070	.242												
10 open smile	13.46	11.377	**.489****	.100	.241	.221	.338*	.129	-.048	.155	.807**											
11 closed smile	7.79	6.096	**.351***	-.207	.166	.144	-.068	.188	-.060	.385*	.585**	.384**										
12 lip corners down	6.71	6.309	-.191	-.088	-.145	.198	-.040	-.152	-.141	.011	.261	-.209	-.065									

13 no eyebrow movement	48.15	25.122	-.170	-.188	.114	.343*	.262*	.199	.054	.160	-.126	.090	-.094	-.120							
14 raised eyebrows	39.27	21.472	-.163	-.053	.071	.279*	.363**	.158	.038	.136	-.062	.132	-.142	-.067	.956**						
15 lowered eyebrows	8.74	10.180	-.180	**-.457****	.250	.222	-.221	.081	-.005	.072	-.343*	-.162	.021	-.135	.645**	.406**					
16 mixed eyebrows	1.64	0.914	**.947****	.250	.260	.513	-.261	-.199	-.720	.342	-.024	.008	.334	-.229	-.331	-.420	-.016				
17 no gestures	70.63	37.480	**-.221**	-.160	.454**	.145	.209	.044	.030	-.061	.040	.100	.102	-.014	.203	.154	.224	-.075			
18 upwards palms	21.91	19.626	.119	-.164	.387**	.203	.142	-.161	-.148	-.102	.166	.241	.286*	-.105	.056	.035	.060	.203	.692**		
19 downward or inward palms	39.65	24.426	-.085	-.054	.118	.225	.111	-.121	-.076	-.133	-.091	-.049	.023	-.104	.052	.006	.066	.346	.521**	.534**	
20 mixed palms	50.23	35.436	-.167	-.232	.399**	.124	.255	-.070	.051	-.198	.216	.284*	.179	-.064	.155	.122	.073	.076	.772**	.659**	.613**
21 clasped hands	45.08	38.639	-.124	-.102	.140	.027	.431**	-.002	.116	-.185	.105	.245	.008	-.282*	.289*	.291*	-.141	-.211	.223	.276*	.545**	.614**

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Table 4b. Correlation gender, transformational leadership, nonverbal behavior durations.

	Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1 gender	1.22	0.420																				
2 trans-formational leadership	5.32	0.438	.237																			
3 object touch	250.12	311.304	.019	-.001																		

4 self-touch head area	154.06	142.213	.148	-.056	-.247													
5 self-touch other areas	153.93	239.745	.179	.131	-.017	-.269*												
6 looking towards group	1404.10	218.046	.010	.213	.191	-.304*	.199											
7 looking away from group	146.82	114.712	**-.265***	-.146	.004	.201	-.050	-.549**										
8 functional looking	249.09	182.322	.154	-.164	-.231	.236	-.218	-.851**	.027									
9 no mouth movement	1715.18	61.162	**-.322***	-.016	-.144	-.151	-.050	-.079	.114	.023								
10 open smile	49.48	48.260	**.423****	.175	.179	.125	.087	.119	-.136	-.057	-.839**							
11 closed smile	20.01	19.331	.205	**-.345***	.026	.273*	-.176	-.036	-.082	.096	-.543**	.263*						
12 lip corners down	18.83	27.208	-.222	-.046	.024	-.109	.247	.078	-.022	-.080	-.339*	-.121	.002					
13 no eyebrow movement	1652.90	107.846	**.336***	.106	-.120	.046	.021	.024	-.163	.074	.073	.030	.084	-.306*				
14 raised eyebrows	112.30	87.521	**-.334***	.132	.042	-.096	.049	.104	.030	-.143	.040	-.075	-.286*	.240	-.884**			
15 lowered eyebrows	34.93	51.703	-.164	**-.431****	.322*	.049	-.132	-.203	.278*	.066	-.151	.005	.200	.237	-.583**	.129		
16 mixed eyebrows	12.78	19.445	.571	-.791	.946*	-.059	-.321	.428	-.372	-.450	-.902*	.834*	.715	.103	-.191	-.116	.966**	
17 no gestures	1134.01	371.144	.094	.053	.248	.177	-.372**	-.360**	-.055	.465**	.069	-.157	.065	.151	-.040	-.011	.185	-.511

18 upwards palms	41.21	45.334	.159	-.250	-.010	.074	-.154	.214	-.118	-.182	-.279*	.230	.471**	-.090	-.088	-.019	.152	.973**	-.127		
19 downward or inward palms	111.37	86.777	-.169	-.108	-.283*	.043	-.009	.080	.118	-.169	.075	-.115	-.046	-.021	.015	-.017	-.029	.894*	-.492**	.298*	
20 mixed palms	102.99	77.059	-.236	**-.306***	-.146	.002	-.054	.259*	.027	-.327*	-.257*	.132	.280*	.083	-.217	.077	.277*	.829*	-.469**	.524**	.616**
21 clasped hands	419.97	321.029	-.046	.043	-.179	-.216	.455**	.301*	.020	-.375**	.038	.127	-.192	-.186	.103	-.007	-.272*	.014	-.881**	-.214	.095	.053

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

9.5 Results independent t-tests nonverbal behaviors

Table 5a. Insignificant results of transformational leadership (>=5.61) and positive nonverbal behaviors.

Behavior	M	SD	t-value	Df	p-value
Looking towards group frequency	107.12	33.277	-1.648	42	0.107
Open smile frequency	13.38	12.373	-0.032	42	0.975
Closed smile frequency	6.21	5.299	-1.132	39	0.265
Raised eyebrows frequency	35.80	17.446	-0.727	42	0.471
Open smile duration	55.02	62.138	0.515	42	0.609
Raised eyebrows duration	132.37	121.617	0.848	16.75	0.408

Table 5b. Results of gender and nonverbal behaviors.

Behavior		M	SD	t-value	Df	p-value
Object touch frequency	Male	21.98	21.666	-.156	39	.877
	Female	23.34	28.121			
Self-touch head area frequency	Male	19.35	13.569	-1.804	42	.078
	Female	28.61	16.582			
Self-touch body frequency	Male	18.17	15.157	-.011	40	.991
	Female	18.22	8.407			
Looking towards group frequency	Male	119.54	43.472	-.795	42	.431
	Female	131.80	40.338			
Looking away from group frequency	Male	83.22	39.594	1.403	42	.168
	Female	64.22	29.349			
Lip corners down frequency	Male	7.36	6.614	1.183	37	.244
	Female	4.54	4.861			
Raised eyebrows frequency	Male	41.15	22.272	1.074	42	.289
	Female	32.87	18.035			
Lowered eyebrows frequency	Male	9.68	11.203	1.156	40	.255
	Female	5.27	3.460			
Mixed eyebrows frequency	Male	1.01	0.005	-3.822	1	.163
	Female	2.59	0.585			
Upward palms frequency	Male	20.66	18.383	-.780	42	.440
	Female	26.19	23.978			
Downward/inward palm frequency	Male	40.76	25.054	.551	42	.584
	Female	35.88	22.991			
Mixed palms frequency	Male	53.40	33.761	1.097	42	.279
	Female	39.45	40.657			
Clasped hands frequency	Male	47.68	38.976	.800	41	.428
	Female	36.48	38.195			
Object touch duration	Male	247.05	259.332	-.118	39	.907
	Female	261.06	473.047			
Self-touch head area duration	Male	142.77	150.517	-.970	42	.338
	Female	192.44	106.960			
Self-touch body duration	Male	130.17	145.194	-.729	10	.483
	Female	229.98	425.201			
Looking towards group duration	Male	1402.89	222.071	-.067	42	.947
	Female	1408.20	215.190			
Functional looking behavior duration	Male	234.01	175.811	-1.012	42	.317
	Female	300.35	204.220			
Open smile duration	Male	38.53	31.653	-2.009	10	.072
	Female	86.72	73.895			
Closed smile duration	Male	17.78	17.068	-1.311	39	.198
	Female	26.91	24.895			
Lowered eyebrows duration	Male	39.31	56.802	1.053	40	.298
	Female	18.86	20.595			
Mixed eyebrows duration	Male	4.67	5.426	-.916	1	.523
	Female	24.95	30.984			
Upward palms duration	Male	37.34	39.839	-1.047	42	.301
	Female	54.39	61.237			
Downward/inward palms duration	Male	119.23	92.169	1.111	42	.273
	Female	84.64	61.662			
Mixed palms duration	Male	112.74	76.670	1.574	42	.123
	Female	69.84	72.368			
Clasped hands duration	Male	427.98	320.058	.294	41	.770
	Female	393.53	340.163			

9.6 Results of t-tests between transformational leadership and gender

Table 6. Results of classes and factors of transformational leadership and gender.

		M	SD	t-value	Df	p-value
Low, middle, and high transformational leadership	Male	5.27	0,436	-1.313	43	.196
	Female	5.51	0.411			
Idealized influence (attributed)	Male	1.91	0.781	-1.514	43	.137
	Female	2.30	0.949			
Idealized influence (behavior)	Male	5.39	0.495	-.649	43	.520
	Female	5.66	0.458			
Inspirational motivation	Male	5.39	0.399	-.970	43	.338
	Female	5.48	0.454			
Intellectual stimulation	Male	5.31	0.539	-1.476	43	.147
	Female	5.49	0.408			
Individualized consideration	Male	5.27	0.460	-1.184	43	.243
	Female	5.51	0.423			