The Influence of Non-Verbal Behaviour on Meeting Effectiveness and Pro-Active Behaviour: A Video Observational Study

Author: Tim Greven
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT,
Based on the nonverbal leadership literature, it has been hypothesized that hand gestures and body gestures have an influence on both perceived meeting effectiveness and pro-active behaviour of their followers. The research is focused on video-observations of team meetings, consisting of fine-grained codings of non-verbal behaviour displayed during the meetings, as well as several surveys that have been filled-out by team-members within the teams that have been recorded. The data consisted of 20 leaders and 192 followers which are employed in a large public organization. As a result, one correlation has been found, this correlation implies that upward palms gestures have a negative influence on the level of pro-activity of the followers. In the discussion section the outcomes of the analysis were discussed and suggestions will be given for future research.

Graduation Committee members:
Prof. Dr. C.P.M. Wilderom
J.G.W.L. Smits, MSc

Keywords
Non-verbal Behaviour, Pro-Active Behaviour, Hand Gestures, Body Gestures, Meeting Effectiveness, Leadership Behaviour and Video-Method Research

9th IBA Bachelor Thesis Conference, July 5th, 2017, Enschede, The Netherlands.

1. Introduction

Nowadays non-verbal behaviour is getting more attention from management scholars. However, even though it is such an interesting topic for management there is a significant lack in literature and fieldwork according to Bonaccio et al. (2016, p. 2). Who states: *"Given the clear interest in the popular press for body language and nonverbal behavior in general, it is surprising to notice that management scholars have lagged begin in understanding this seemingly important form of communication."* One of the main problems lies in the fact that all this literature is scattered over several aspects. Bonaccio et al. (2016, p. 2) states that it can be a challenge for organizational scientists interested in studying nonverbal behaviour to access a concise treatment of this topic. Furthermore, there is a lot of literature regarding both topics separately, non-verbal behaviour and leadership. However, there is a significant lack in literature that connects those two topics.

Between 65% and 95% of all human interaction is fuelled by nonverbal behaviour (Birdwhistell,1970). Therefore, it can be stated that it is surprising that there is such a lack in research regarding non-verbal behaviour since this is relatively important during human interactions according to Birdwhistell (1970). If there would be more knowledge about this topic, effective leadership could be improved and made more efficient and effective. However it should be commented that human interaction can still be effective when people have limited access to each's others non-verbal cues. An example of this is a conversation by phone. Therefore, it can be stated that in the case of non-physical human interaction non-verbal behaviour is significantly less important. A research that has been conducted by Baym et al. (2004) shows that the way of communication that is being used the most is face-to-face. Therefore, it can be stated that indeed non-verbal behaviour is important during the daily life since face-to-face communication is the most used way of communication.

The distinction between verbal and non-verbal behaviour is not always clear. This is confirmed by Darioly and Schmid Mast (2014, p. 1) they state that*: " For example "emblems," such as nonverbal gestures like the "okay" made with the thumb and forefinger or the "thumbs up" gesture, have a distinct verbal meaning."* Knapp and Hall (2010) state that the functions of non-verbal behaviour include showing the characteristics of a person, whether they are dominant or friendly and that they express emotions. This is done by for example eye gaze, body movements and posture, touch, smell and walking style.

As mentioned before it is important for leaders to have the capabilities to transfer their power and authority via non-verbal behaviour. This is confirmed by Remland (1981) who states that when the cues of verbal and nonverbal behaviour are in contradiction with each other the employees will most likely trust the leader's nonverbal behaviour. Krot and Lewicka (2012) state that: "Trust is important in the business environments because it reinforces and strengthens intra-organizational and inter-organizational relationships." Therefore, it is important for a leader to have good knowledge regarding non-verbal behaviour since it will determine whether they are effective or not. Furthermore, since trust is important in the business environment it is important that managers have a good understanding about non-verbal communication since, as mentioned before, when verbal and non-verbal communication are contradictory most employees will trust the non-verbal way of communication. When looking at the types of leadership regarding nonverbal behaviour Darioly and Schmid Mast (2014, p. 4) state that emergent leadership and perceptions of leadership are the most important types of leadership regarding nonverbal behaviour. In terms of the research which is conducted in this paper a look will be taken on the perceptions of leadership.

As mentioned before, there is a significant lack in connecting non-verbal behaviour with leadership that shows how non-verbal behaviour influences the way of leadership. Therefore, this report, as well as the research conducted to support this report, will be connecting several non-verbal behaviour types with several aspects of leadership, such as meeting effectiveness and leader effectiveness. During this research a look will be taken at body gestures as well as hand gestures. For the body gestures the main focus will be on body lean movements and whether the body posture is expansive or constricted. The hand gestures that will be analysed are the illustrated gestures and adaptors, this is basically whether the hands are oriented with the palm upwards or the palm downwards and whether the leaders touch either themselves or objects with their hands. The results of this analysis will be linked with whether the manager had an influence on the pro-active behaviour of the group that was present during the meeting. These aspects were chosen because when having a team meeting this is about the team and not only about what the manager is saying. Therefore, the level of pro-activeness of the employees can be seen as important since this might influence the outcome of the meeting. Because of this the second aspect has been chosen, which is meeting effectiveness. This will show whether pro-activeness indeed has a positive influence on meeting effectiveness as well as the influence of non-verbal behaviour on meeting effectiveness. Furthermore, this will also be linked with the effectiveness of the meeting overall. Therefore, the research question of this report will be: **What is the role of non-verbal leader behaviour on the followers' perception of meeting effectiveness as well as the level of pro-active behaviour within a team meeting?**

The goal of this research is to add value to the current knowledge about the connection between non-verbal behaviour and leadership, with a main focus on pro-active behaviour and meeting effectiveness. The non-verbal behaviour types that are being analysed are body gestures and hand gestures. The knowledge that will be added to the current knowledge by this research is whether non-verbal behaviour has an influence on both level of pro-activeness as well as meeting effectiveness. Next to this the influence of pro-activeness on meeting effectiveness will be analysed.

2. Theoretical Framework

2.1 Body posture and lean movements

A definition should be created about body lean movements and constricted and expensive body posture. Body lean movements can be defined as in whether the body of a person is leaning forward or leaning backward. Mehrabian (1972) states that body lean movements are significantly important to influence the level of immediacy. This is confirmed by the fact that he says that no matter what kind of object has been put between an employee and a manager, the manager is still able to decrease or increase the distance by leaning forward or

backward. Furthermore, it can be perceived that leaning forward is showing that the person is interested in what the other person is saying. Leaning backwards could have two effects, either the person wants to be as far away as possible from the other person since he does not like what he is saying or he is not interested by it, or the person is relaxed and that is why he leans back.

The next type of body gesture that is important to answer the main research question is the overall body posture. Two types can be distinguished when looking into the literature: An expressive posture is when a person makes himself big like leaning forward or spreading his arms. A constricted posture implies the complete opposite this is about when a person tries to make himself small for example crossing his arms over each other. Which of these two contain which effect is defined by Carney et al. (2010). They state: "Humans and other animals express power through open, expansive postures, and they express powerlessness through closed, contractive postures." In this sentence a contractive posture is equal to a constricted posture. Therefore, it can be concluded that when someone's body posture is very open and very expansive this person is expressing power. When someone is very closed and constricted they are expressing powerlessness. According to Cashden (1998), the body posture of people that have a more dominant position are often more open than the body posture of their subordinates.

2.2 Hand gestures

In this research the focus will lie on the illustrated hand gestures as well as adaptors. Illustrated hand gestures are about the positioning of the hand palms of a certain person. They can be oriented downwards, upwards or a mix of them with one palm downwards and one palm upwards.

According to Kendon (2004), having the palms downwards means that the person wants to interrupt a conversation or that a person wants to stop the conversation because it either makes no sense or that this person does not agree with what the other person is saying. He also states: "Gestures of the Open Hand Prone or 'palm down' family are used in contexts where something is being denied, negated, interrupted or stopped, whether explicitly or by implication." Kendon (2004) also writes about the palms upwards situation. He states that this means that the speaker is offering, giving or showing something. It also implies that the speaker is requesting the reception of something. When the hands start moving apart from each other but also keep palms up this means that the speaker is aiming at a withdrawal of action or of non-intervention. Furthermore, a message is more persuasive with an eager (palms up) gesture style (Cesario and Higgins, 2007). Matsumoto and Hwang (2013) mention that when a person has his hands facing down with the palms this can be indicated as a stopping sign or that something is not understood or missing. Furthermore, they imply that having the palms faced down might imply signing someone to go away. Furthermore, an additional type of illustrative hand gestures has been added to the coding scheme. This type is clasped hands, which can be divided into two different types which are power gestures and the actual holding of both hands by a leader. Power gestures are hand gestures that are used to make the leader appeal more powerful as well as making the leader feel more powerful. One of the most classic examples is the power triangle that is often used by Angela Merkel. This gesture basically implies that all finger tips are touching each other and therefore make a triangle.

As mentioned before, the second aspect regarding hand gestures are the adaptors. Adaptors are usually divided into self-adaptors, gestures in which individuals touch themselves and object-adaptors, meaning that an individual touches an object. (Engel, 2016) According to Mandal (2014) self-adaptors are a sign of worried and fearful people. He also mentions that when people are touching themselves and are running their hand through their hair implies that they are worried. Whereas, people that are feared hide their faces in both hands or clasp their hands together. Hall, Carter and Horgan (2001) state that according to their research it can be established that superiors use significantly less self-touch than their followers. As an result of this it can be stated that self-adaptors can be seen as an gesture that is used by people that express less power and dominance and that these people have a submissive type as behaviour. (Engel, 2016)

2.2 Meetings

2.2.1 Meeting effectiveness

When talking about meeting effectiveness during this research it is meant that the leaders feel that the information that they wanted to process has successfully reached their employees. Furthermore, it also means that the employees felt that the meeting was useful and effective. Romano and Nunamaker (2001) state: *"Studies reveal that meetings are indeed costly and unproductive, yet essential and increasing in number and duration underscore the need for meeting productivity research."* Therefore, it can be said that a research regarding the influence of nonverbal-behaviour and pro-activeness might be valuable for the community to learn more about meeting effectiveness. Kayser (1990) states in different words that meetings nowadays are not efficient nor effective. He states: *"A meeting is a gathering where people speak up, say nothing, and then all disagree."* This confirms the point that has been mentioned before, which states that the research regarding meeting effectiveness is needed and that this research might have a contribution to the knowledge about meeting effectiveness.

But why is meeting effectiveness important? Rogelberg et al. (2006) state that meetings are the used to integrate and coordinate the work of people within an organization. This implies that to reach the goals that are set by a company their employees not to work effective and the guidance in this is done during meetings. Therefore, meetings are important to make sure that the organizations is running according to plan or even better.

2.2.2 Antecedents of meeting effectiveness

According to Kocsis et al. (2015), it is important to have a systematic process in place. If this is not the case executing the meeting plan as well as achieving the meeting goals will be in jeopardy. Another factor that influences the meeting effectiveness is that the objectives have to be clear, there might be a lack of focus on the meeting and the value added by the followers might be not of a significant value (Kocsis et al. 2015). Furthermore, they mention that an important assistant in making a meeting more effective are facilitators. They can

establish a clear task-oriented meeting and apply appropriate collaboration technologies (Clawson, Bostrom & Anson, 1993). Kocsis et al. (2015) states: *"Facilitators are similar to meeting chairpersons, but unlike a chair, they do not have a personal stake in the outcome nor do they typically have a superior-subordinate relationship with the team members."* However, non-verbal behaviour of leaders might also have an influence on meeting effectiveness. Since there is a lack in literature linking meeting effectiveness with non-verbal behaviour this will be researched in this report. Therefore, the following hypothesis have been defined.

H_1: The leaning forward of a leader has a positive influence on the effectiveness of a team meeting, whereas leaning backwards has a negative influence.
H_2: An expansive body posture of a leader has a positive influence on the effectiveness of a team meeting, whereas a constricted body posture has a negative influence.
H_3: The usage of illustrative hand gestures of a leader has a positive influence on the level of effectiveness of team meetings.
H_4: The usage of adaptors by a leader has a negative influence on the level of effectiveness of team meetings.

2.3 Pro-active behaviour

2.3.1 Pro-active behaviour in meetings

According to Aragon-Correa (1998), proactive and self-directed behaviour has become increasingly more important within organizations. This is caused by the frequent changes in the demands that organizations give to their employees as well as the uncertainty in the work environment. In the case of this research pro-activeness is perceived of whether the employees that were present at the meeting were actively participating in the meeting. This implies that they said what was either bothering them or that they came up with something that could add value to the meeting.

When looking at why proactive behaviour is that important Fritz and Sonnentag (2009) state that an employee might developed ways to fulfil tasks more efficiently when they are motivated to have pro-active behaviour. Crant (2000) defines pro-active behaviour as follows: *"Taking initiative in improving current circumstances or creating new ones; it involves challenging the status quo rather than passive adapting to present conditions."*

Regarding the 'pro-activeness' of followers three kind of followers were defined by Carsten et al. (2010). The first type of follower is the passive follower who does not have any input into the organization and simply just take orders from their leaders and conduct it in however the leader wants it done. Secondly, there is the active follower which are having their own opinion but still commit their loyalty to their leader. The last type of follower is the pro-active follower. This follower takes initiative and try to use every opportunity to express their concern or opinion about a certain topic. It is considered that effective followers are those who are passive simply because to adapt to the leader and do everything from the leader's point of view. However in order to achieve effective followership requires followers which are not afraid to show their opinion and their concerns. Therefore, pro-activity is important within an organization.

Therefore, this research will consist of an analysis about how non-verbal leader behaviour can help motivating their employees to become more pro-active since it gives a refreshing look into topics in which a leader might have a tunnel view.

2.3.2 Influences on pro-active behaviour

According to Bateman and Crant (1999) it is possible to have an influence on the level of pro-active behaviour of people. They state that Pro-action is like most other work behaviour: It is a function of both individual dispositions and the work environment. Thus, it can be harvested, grown, and sustained via appropriate approaches to selecting, training, liberating , and inspiring.

In the case of this research the two most outstanding influences on pro-active behaviour according to Bateman and Crant (1999) are liberating and inspiring. These two ways of influencing pro-active behaviour are linked with managers, so managers indeed could have an influence on pro-active behaviour. With liberating is meant that the employees or followers should be devoted more freedom by the manager. This will result in more pro-active behaviour since they feel more free to speak about something that they would not say normally. Inspiring implies that the manager in somehow way does something that makes his or her employees more pro-active.

2.3.3. Link between leader behaviour and follower pro-active behaviour

Even though pro-active behaviour appears important for an organization it also faces a negative side (Fuller et al. (2015). Because, even though pro-active behaviour has an positive influence on the wellbeing of the organization, leaders might not acknowledge and reward this behaviour (Grant et al. 2009). Therefore, it is important how leaders react to the amount of pro-activeness which is expressed by his/her followers, this is important for the innovation within an organization (Bolino et al., 2010).

H_5: The leaning forward of a leader has a positive influence on the level of-proactive behaviour of the followers in a team meeting, whereas leaning backwards has a negative influence.
H_6: An expansive body posture of a leader has a positive influence on the level of-proactive behaviour of the followers in a team meeting, whereas a constricted body posture has a negative influence.
H_7: The usage of illustrative hand gestures of a leader has a positive influence on the level of pro-activeness of followers in a team meeting.
H_8: The usage of adaptors by a leader has a negative influence on the level of pro-activeness of followers in a team meeting.
H_9: There is a positive influence of the level of pro-active behaviour of meeting members on the level of meeting effectiveness

All the hypotheses that have been introduced in this chapter will be used to analyse the influence of non-verbal behaviour on both perceived meeting effectiveness as well as pro-active follower behaviour.

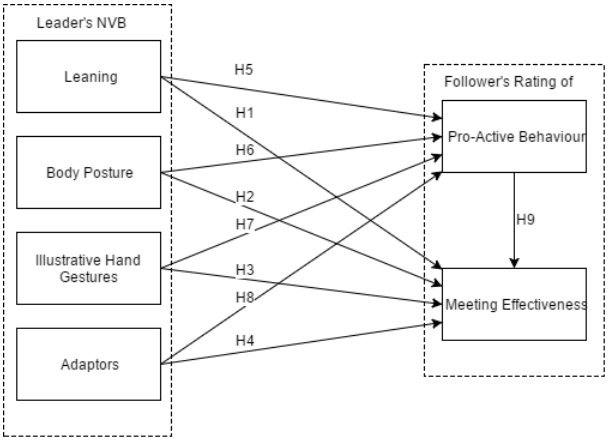

Figure 1 Conceptual model

Figure 1 shows a visualisation of the afore mentioned hypotheses. This displays a clear overview of how the variables are linked with each other

3. Methodology

3.1 Research Design

This study is based on a cross-sectional design which includes three different data sources. The first data source is an expert that is rating the leader according to his/her leadership capabilities. Secondly, the followers of the leaders fill out a survey in which they grade their perception of the leader of their meeting. The final data source is a video which has been systematically coded by several researchers. This coding is about the non-verbal behaviour of the leaders during their regular staff meetings. Because there is a diversity in ways to generate data common source bias has been reduced and excluded in this report.

3.2 Sample

The sample that has been analysed consisted of 20 team meetings within a large public-service organization. These meetings consisted of in total 20 leaders and 192 followers who answered the survey. Followers that did not answer the survey for at least 50%, were not officially part of the team or showed no variety in answering the questions are not included in the sample. The total amount of followers that were present during the meetings was 210 followers. There were 17 male leaders and 3 female leaders with a mean age of 51.55 years old and a minimum age of 34 and a maximum age of 64. The standard deviation for age is 8.54. The mean of the job tenure of those 20 leaders is 23.38 years with a minimum of half a year and a maximum of 46 year with a standard deviation of 17.47. The followers consisted of 138 male followers and 60 female followers, 12 followers did not answer this question during the survey. The followers were 49.43 years old on average with a minimum of 25 years old and a maximum of 64 years old and a standard deviation of 10.02, however 22 followers did not answer this question. The job tenure of the followers has a mean of 24.88 years with a minimum of 0.2 year and a maximum of 48 years and a standard deviation of 13.65, however 17 followers did not answer this question.

3.3 Coding Procedure

The coding of the videos that were recorded during the 40 meetings were analysed by two researchers. McHugh (2012) states that: *"The importance of rater reliability lies in that fact that it represents the extent to which the data collected in the study are correct representation of the variables measured."* This implies that the inter-rater reliability is high when both researchers agree on the same result. The inter-rater reliability that resulted from the research was for body gestures 92.03% whereas hand gestures scored an inter-rater reliability of 94.46%. The kappa that both gestures scored were respectively 0.91 and 0.93. The coding took place in one room where all researchers will do their coding. The coding has been conducted by the usage of certain equipment (i.e. Noldus Observer XT, Noldus, et al., 2000; Zimmerman et al., 2009) which has been designed for video coding, which has been provided by the University of Twente. The length of the videos differ from between 1 hour and 2 hours. However, for the purpose of standardization the first 30 minutes has been coded. The actual coding has been started from the start of the actual meeting. The coding has been done via a coding scheme which identifies when a certain non-verbal behaviour occurs and when this behaviour has to be coded. When all videos were coded each researcher picks the data he/she needs and starts conducting the actual research with the collected data.

3.4 Measures

Pro-active behaviour. Pro-active behaviour has been analysed by using five questions regarding the pro-active behaviour within the meeting that has been observed. These five questions have been based on analysis of Watson, Clarke & Tellegen (1988) as well as Morrison & Phelps (1999). The scale that has been used for the questions ranged from one to seven where one meant "I strongly disagree" and seven meant "I strongly agree". The Cronbach alpha of this variable was 0.884.

Meeting effectiveness Meeting effectiveness has been analysed by using three questions that had to be answered by the followers. These questions are based on research by Nixon & Littlepage (1992), Engleberg & Wynn (2007) and Baran et al. (2012). The scale that has been used for those questions ranged from one to seven where one meant "I strongly disagree" and seven meant "I strongly agree". The Cronbach alpha of this variable was 0.916.

Non-verbal Behaviour

The measurement of the non-verbal behaviour of a leader has been done via the Observer XT, as mentioned before. The coding has been done by two different coders which after they coded a video compared their results to make sure that there is no bias present in the research. The coding also took place in a neutral place namely the video lab of the University of Twente.

Furthermore, the coding has been done by using a pre-established coding scheme which has been described in more detail in Dethmers (2017). In this coding scheme all of the non-verbal behaviour types have been explained and when something should be coded and when it should not. By using this coding scheme the coders have already established a mind-set which is relatively similar since they use the same coding scheme. Each type of behaviour has been visualized by

using several illustrations, this helps in understanding what is meant in the coding scheme.

4. Results

4. Results

In Table 1 & 2 an overview can be found about the frequency and duration of all of the independent variables that have been used during the analysis, these are the types of non-verbal behaviour. As can be seen in Table 1 it can be said that the body postures have a bigger duration than the hand gestures. The most present body posture within all the videos is the expansive body posture with 60.58% of coding in an average video. The gesture that has the least duration within an average video is upward palms, this gesture was only used during 2.26% of an average video. One thing that has become clear while looking at Table 1 is that the body gestures are present longer within an average video than hand gestures. This can be explained by the fact that in the coding scheme the illustrated hand gestures as well as the adaptors are not mutually exclusive whereas the body gestures are mutually exclusive. This implies that throughout the whole video the leader either has a constricted body posture or an expansive body posture.

Table 2 provides an overview of the total frequency of the non-verbal behaviours as well as the mean per video in frequencies. Table 2 is completely opposite compared to Table 1, here the hand gestures have a higher frequency than the body gestures. The hand gesture with the highest frequency is mixed palms which occurred on average 48.5 times in a video. The gesture with the lowest frequency is leaning backwards this gesture only occurred on average 8.2 times per video. The most outstanding gesture within both tables is clasped hands. This gesture has both a relatively high duration as a relatively high frequency. What can be concluded after looking at Table 1 and Table 2 is that the body gestures occur less often than hand gestures whereas the duration of body gestures is way longer than those of hand gestures. This might be caused that leaders do not shift in their body posture as often as they intensively use hand gestures. Therefore, for the rest of this analysis it has been chosen that the body gestures will be analysed according to their duration whereas the hand gestures will be analysed according to their frequency.

Table 1. Duration of Non-verbal behaviours

	Duration		
	Total duration (in minutes)	Mean per video (minutes)	Percentage of coding (Video = 30 minutes)
Expansive body posture	363.51	18.18	60.58%
Constricted body posture	241.25	12.06	40.21%
Leaning forward	226.84	11.34	37.81%
Leaning backward	188.29	9.41	31.38%
Object touch	97.00	4.85	16.17%
Self-touch-head	44.63	2.23	7.44%
Self-touch-body	40.36	2.02	6.73%
Upward palms	13.54	0.68	2.26%
Downward/Inward palms	27.05	1.35	4.51%
Mixed palms	38.28	1.91	6.38%
Clasped hands	146.85	7.34	24.48%

Table 2. Frequency of Non-verbal behaviours

	Frequency	
	Total frequency	Mean per video (frequency)
Expansive body posture	196	9.80
Constricted body posture	194	9.70
Leaning forward	240	12.00
Leaning backward	164	8.20
Object touch	408	20.40
Self-touch-head	373	18.65
Self-touch-body	249	12.45
Upward palms	430	21.50
Downward/Inward palms	509	25.45
Mixed palms	970	48.50
Clasped hands	786	39.30

Table 3 shows a correlation matrix of all the non-verbal behaviour types with both meeting effectiveness as well as pro-active behaviour. A correlation analysis with Pearson has been used to analyse which variables have a significant correlation with meeting effectiveness and pro-active behaviour. When looking at Table 3 it shows that there is only one significant correlation between the independent variables and the dependent variables. This correlation is between upward palms and the follower ratings of pro-active behaviour. $r = -.481$, $p = .05$. There is a negative correlation between those two variables of -0.481 which is significant at a 0.05 level (1-tailed). This correlation has a relatively strong influence on pro-active behaviour, since it implies that when a leader uses one upward palm movement the score regarding pro-active behaviour goes down with almost half a point. This is relatively high on a 7 point scale.

Table 3. Correlation Matrix

Variables	1	2
1 Follower Rating of Meeting Effectiveness		
2 Follower Ratings of Pro-Active Behaviour	.148	
3 Expansive Body Posture (duration)	.082	.050
4 Constricted Body Posture (duration)	-.072	-.069
5 Leaning Forward (duration)	.002	.115
6 Leaning Backward (duration)	-.005	.110
7 Object-touch (frequency)	-.007	-.088
8 Self-Touch Head (frequency)	.345	.279
9 Self-Touch Body (frequency)	-.027	-.181
10 Upward Palms (frequency)	.170	-.481*
11 Downward Palms (frequency)	.363	.076
12 Mixed Palms (frequency)	.248	-.016
13 Clasped Hands (frequency)	.081	-.014

= P <.05 level (1-tailed)

4.1 Correlation between NVB and meeting effectiveness

Table 4 gives an overview of the regression analysis that has been used to test both hypothesis 1 and 2. First of all, Age and Gender have been used as control variables within this regression analysis to make sure that the results that are shown are reliable. Therefore, model 1 can be seen as a controlling model with which the second model will be compared to see what the effect of the non-verbal behaviours is. As Table 4 shows there is no significant correlation between any of the variables and meeting effectiveness. Therefore, both hypothesis 1 and hypothesis 2 have been rejected. When looking at the differences between model 1 and model 2 it can be said that there is not much difference between the R-squares and therefore the body postures do not explain much of the variance in meeting effectiveness.

Table 4. Regression analysis to test the hypotheses regarding body gestures and meeting effectiveness

	Meeting effectiveness	
	Model 1	Model 2
Age	-.120	.250
Gender	.590	.660
Expansive Body Posture		.004
Constricted Body Posture		.004
Leaning Forwards		.001
Leaning Backwards		.001
R-Square	.145	.165

= P <.05 level (1-tailed)

The second type of hand gestures that has been analysed are the hand gestures, which can be further divided into illustrative hand gestures and adaptors. Table 5 shows the regression analysis which has been used to test hypothesis 3. Again, Age and Gender has been used as constant variables as can be seen in Table 4 as well. As a result of the regression analysis that has been conducted in Table 5 it can be established that there is no significant correlation between any of the illustrative hand gestures and meeting effectiveness. Furthermore, the variance in meeting effectiveness that is explained by the illustrative hand gestures is almost 9% which is relatively high. As a result of this regression analysis, hypothesis 3 has to be rejected since there is no significant correlation between meeting effectiveness and illustrative hand gestures

Table 5. Regression analysis to test the hypotheses regarding illustrative hand gestures and meeting effectiveness

	Meeting effectiveness	
	Model 1	Model 2
Age	-.120	-.11
Gender	.590	.486
Upward Palms		.004
Downward Palms		.100
Mixed Palms		.003
Clasped Hands		-.005
R-Square	.145	.231

= P <.05 level (1-tailed)

The last type of non-verbal behaviour that has been analysed are the adaptors. Table 6 gives an overview of the regression analysis that has been used to test the correlation between adaptors and meeting effectiveness. With this regression analysis hypothesis 4 will be tested. Once more Age and Gender has been used as constant variables in this analysis. When looking at Table 6 it is clear that there is no significant correlation between any of the variables and meeting effectiveness. Therefore, hypothesis 4 has to be rejected. However, when looking at the R-square of both models it can be said that in the second model the explained variance is higher by almost 9%. This implies that the adaptors explain 9% of the change meeting effectiveness.

Table 6. Regression analysis to test the hypotheses regarding adaptors and meeting effectiveness

	Meeting effectiveness	
	Model 1	Model 2
Age	-.120	-.110
Gender	.590	.517
Object Touch		.000
Self-Touch Head		.019
Self-Touch Body		.003
R-Square	.145	.230

= P <.05 level (1-tailed)

Resulting from this section all hypothesis regarding meeting effectiveness and non-verbal behaviour have been rejected. Another interesting topic might be if there is a difference between the high scoring groups and the low scoring groups. Therefore, the 5 leaders that scored the highest on terms of meeting effectiveness have been compared with the 5 leaders that scored the lowest on terms of meeting effectiveness. To analyse this an one-way ANOVA analyses has been used. This method of analysis analyses whether there is a statistical significant difference between the means within two groups. For example, it looks whether there is a significant difference between the amount of upward palm gestures conducted by the 5 leaders with the highest meeting effectiveness and the 5

lowest. Table 7 gives an overview of this analysis. As an result of this analysis it can be stated that there is no difference between the means of the 5 leaders with the highest meeting effectiveness and the means of the 5 leaders with the lowest meeting effectiveness.

Table 7 One way ANOVA analysis regarding meeting effectiveness using the leaders with the highest meeting effectiveness (n = 5) and the leaders with the lowest meeting effectiveness (n=5)

ANOVA

	Sig.	Mean Lowest 5	Mean Highest 5	SD Low 5	SD High 5
Expansive Body Posture	.547	970.43	1212.46	620.26	598.01
Constricted Body Posture	.579	849.75	628.87	649.28	554.61
Leaning Forwards	.670	668.50	837.58	710.12	473.29
Leaning Backwards	.625	637.02	478.92	450.64	529.14
Upward Palms	.922	16.00	29.00	10.02	26.11
Downward Palms	.144	17.80	34.20	6.53	20.62
Mixed Palms	.901	44.60	57.80	8.41	32.48
Clasped Hands	.329	32.80	39.60	14.34	24.46
Object Touch	.128	22.20	21.00	18.19	19.20
Self-Touch Head	.405	15.00	26.60	7.84	13.96
Self-Touch Body	.606	11.80	11.20	6.38	8.29

*= P <.05 level (1-tailed)

4.2 Correlation between NVB and pro-active behaviour

The following section is about the correlations between non-verbal behaviour and pro-active behaviour. The first type of non-verbal behaviour which has been linked with pro-active behaviour are the body postures. Table 8 gives an overview of the regression analyses which has been used to test hypothesis 5 and 6. It should be noted that Age and Gender are the constant variables in this analysis. As can be seen in Table 8 there is no significant correlation between any of the variables and pro-active behaviour and therefore hypothesis 5 and hypothesis 6 have to be rejected. However, the R-square of body gestures is relatively high since it is 15%. This implies that the variance of pro-active behaviour is for 15% explained by the usage of body postures

Table 8. Regression analysis to test the hypotheses regarding body gestures and pro-active behaviour

	Pro-Active Behaviour	
	Model 1	Model 2
Age	-.008	-.009
Gender	.230	.373
Expansive Body Posture		-.003
Constricted Body Posture		-.004
Leaning Forwards		.000
Leaning Backwards		.000
R-Square	.076	.236

*= P <.05 level (1-tailed)

The next regression analysis that has been conducted is regarding hypothesis 7 which is about the correlation between pro-active behaviour and illustrative hand gestures. Table 9 gives an overview of the regression analysis that has been used to test hypothesis 7, again Gender and Age have been used as constant variables. As Table 9 shows there is a correlation between upward palms and pro-active behaviour, $r = -.016$, $p < .05$. Even though there is a significant correlation hypothesis 7 has to be rejected since it assumed that there is a positive correlation. The correlation that has been found implies that every time a manager uses upward palms it negatively affects the pro-active behaviour score with -0.016 which is based on a 7-scale. For example, when a manager scores 6 on pro-active behaviour and he/she uses one more upward palm gesture her score changes to 5.984. This outcome is more trustworthy than the outcome of Table 3, since this effect seems more realistic. Furthermore, the R-square is relatively high since it increases from model 1 with 0.278. This implies that the illustrative hand gestures account for 27.8% of the variance of pro-active behaviour.

Table 9. Regression analysis to test the hypotheses regarding illustrative hand gestures and pro-active behaviour

	Pro-Active Behaviour	
	Model 1	Model 2
Age	-.008	-.004
Gender	.230	.209
Upward Palms		-.016*
Downward Palms		.002
Mixed Palms		.007
Clasped Hands		-.500
R-Square	.076	.354

*= P <.05 level (1-tailed)

The last type of non-verbal behaviour that has been linked with pro-active behaviour are the adaptors. The regression analysis that has been used to test hypothesis 8 can be found in Table 10. Similar to the other regression analyses Age and Gender are again the constant variables. As a result of Table 10 it can be concluded that there is no significant correlation between any of the adaptors and pro-active behaviour. Furthermore, The change in R-square is relatively which means that the adaptors do not account for much variance of pro-active behaviour.

Table 10. Regression analysis to test the hypotheses regarding adaptors and pro-active behaviour

	Pro-Active Behaviour	
	Model 1	Model 2
Age	-.008	-.006
Gender	.230	.127
Object Touch		-.004
Self-Touch Head		.012
Self-Touch Body		-.008
R-Square	.076	.166

*= P <.05 level (1-tailed)

As mentioned before in the previous section an one-way ANOVA analysis can be used to see whether there is any significant difference in the means of two groups. This also suits the research regarding the followers' level of pro-active behaviour and non-verbal behaviour. Therefore, two groups are developed, the 5 leaders with the highest level of pro-activity and the 5 leaders with the lowest level of pro-activity. The ANOVA analysis can be found in Table 11. Resulting from this analysis it can be said that there is no significant difference between the usage of non-verbal behaviour.

Table 11 One way ANOVA analysis regarding followers' pro-active behaviour using the leaders with the highest pro-active behaviour (n = 5) and the leaders with the lowest pro-active behaviour (n = 5)

	ANOVA				
	Sig.	Mean Lowest 5	Mean Highest 5	SD Low 5	SD High 5
Expansive Body Posture	.652	842.72	1022.17	571.580	638.27
Constricted Body Posture	.636	976.09	784.34	597.170	636.72
Leaning Forwards	.213	409.51	720.97	377.720	349.61
Leaning Backwards	.920	648.08	681.65	425.330	582.85
Upward Palms	.950	32.00	13.80	23.710	7.60
Downward Palms	.214	23.00	30.60	11.900	14.40
Mixed Palms	.176	53.40	49.60	23.510	27.66
Clasped Hands	.141	27.20	40.20	24.650	22.91
Object Touch	.389	21.20	22.00	18.630	20.24
Self-Touch Head	.821	15.00	26.20	4.420	18.02
Self-Touch Body	.847	14.60	7.80	9.560	3.70

*= P <.05 level (1-tailed)

4.3 Correlation between meeting effectiveness and pro-active behaviour

The last remaining hypothesis that has not been tested yet is whether pro-activeness within a team meeting has an influence on the effectiveness of a team meeting. Table 12 shows that there is no significant regression between the level of pro-active behaviour and meeting effectiveness. $p < .05$. Therefore, hypothesis 10 has to be rejected.

Table 12. Regression analysis to test hypothesis 10

	Model 1	Model 2
Age	-.120	-.110
Gender	.590	.573
Follower Rating of Pro-Active Behaviour		.073
R-Square	.145	.147

*= P <.05 level (1-tailed)

4.4 Additional research

As mentioned before in the introduction section, trust is important to be an effective leader. Therefore, an additional analysis has been conducted to see whether trust might have an influence on meeting effectiveness and pro-active behaviour. Table 13 displays a correlation matrix which shows the correlation between perceived meeting effectiveness, pro-active behaviour, body gestures and hand gestures with both the followers' rating of cognitive trust and affective trust. Cognitive trust implies whether the followers believe their leader is reliable and whether they dependent on him/her. Affective trust is about whether there is an emotional bonds between the leader and the followers and whether they have a shared interpersonal care. As can be seen in Table 13. There is a significant correlation between the follower's rating of cognitive trust and meeting effectiveness $r = .704$, $p < .01$. Furthermore, there is a significant correlation between self-touch head and cognitive trust $r = .449$, $p < .05$. When looking at the follower's rating of affective trust it can be stated that there is one significant correlation. This correlation is between affective trust and meeting effectiveness $r = .680$, $p < .01$.

Table 13. Correlation analysis involving trust

	Followers' rating of cognitive trust in leaders	Followers' rating of affective trust in leaders
Pro-active behaviour	.276	.205
Meeting effectiveness	.704**	.680**
Expansive Body Posture	-.167	-.200
Constricted Body Posture	.191	.223
Leaning Forwards	-.010	-.097
Leaning Backwards	.302	.265
Upward Palms	-.010	.013
Downward Palms	.292	.171
Mixed Palms	-.107	-.179
Clasped Hands	-.261	-.364
Object Touch	-.033	-.156
Self-Touch Head	.449*	.356
Self-Touch Body	-.082	.019

*= P <.05 level (1-tailed)
**= P <.01 level (1-tailed)

To see how these correlations influence the variables a regression analysis has been conducted. Table 14 gives an overview of the regression analysis to see whether both cognitive trust and affective trust have an influence on meeting effectiveness. As mentioned before, Age and Gender have been used as constant variables. As a result of this analysis it can be stated that there is no significant regression between both

affective trust and cognitive trust regarding their influence on meeting effectiveness.

Table 14. Regression analysis meeting effectiveness with both cognitive trust and affective trust

	Meeting effectiveness	
	Model 1	Model 2
Age	-.012	-.019
Gender	.590	-.277
Followers' rating of cognitive trust in leaders		.491
Followers' rating of affective trust in leaders		.519
R-Square	.145	.540

*= P <.05 level (1-tailed)

Since no significant regression has been found two extra regression analysis have been conducted to see whether meeting effectiveness has an influence on trust. Table 15 shows the regression analysis between meeting effectiveness and cognitive trust which has been conducted, also self-touch head has been included since it showed a correlation in the correlation matrix. Age and Gender have been used as constant variables. From Table 15 it can be concluded that there are several significant regressions. The first one is that gender has a significance influence on the followers' rating of cognitive trust $r = .985$, $p < .05$. When meeting effectiveness is added this influence changes to $r = .638$, $p < .05$ and when only meeting effectiveness is included in the model the influence of gender changes to $r = .650$, $p < .05$. When looking at the influence of meeting effectiveness on cognitive trust it can be stated that in both model 2 and 3 there is a significant regression between meeting effectiveness and cognitive trust $r = .457$, $p < .01$ and $r = .521$, $p < .01$. When looking at the R-square of meeting effectiveness the difference between model 1 and model 3 has to be calculated which is .314

Table 15. Regression analysis cognitive trust with meeting effectiveness and self-touch head

	Followers' rating of cognitive trust in leaders		
	Model 1	Model 2	Model 3
Age	.005	.011	.011
Gender	.985*	.638*	.650*
Meeting effectiveness		.457**	.521**
Self-touch head		.012	
R-Square	.295	.808	.609

*= P <.05 level (1-tailed)
**= P <.01 level (1-tailed)

Table 16 gives an overview of the regression analysis between the followers' rating of affective trust and meeting effectiveness, again Age and Gender have been used as constant variables. Similar to the case of cognitive trust gender has a significant influence on affective trust $r = .765$, $p < .05$. When meeting effectiveness is included in the model this influence changes $r = .530$, $p < .05$. Furthermore, meeting effectiveness has a significant influence on the followers' rating of affective trust $r = .397$, $p < .01$. The R-square of meeting effectiveness in the case of affective trust is .310

Table 16. Regression analysis affective trust with meeting effectiveness

	Followers' rating of affective trust in leaders	
	Model 1	Model 2
Age	.010	.014
Gender	.765*	.530*
Meeting effectiveness		.397**
R-Square	.293	.603

*= P <.05 level (1-tailed)
**= P <.01 level (1-tailed)

5. Discussion

Three different methods have been used during this research, the first one is the video-based analysis which is supported by two different surveys one survey in which followers reflect their leaders and one in which leaders reflect on themselves regarding the staff-meeting and his/her skills.

The first hypothesis that has been tested during the analysis is the hypothesis that assumes that when a leader leans more frequently to the front this has a positive influence on meeting effectiveness whereas leaning backwards has the opposite effect. From both the regression analysis as well as the correlation analysis the hypothesis cannot be supported. However, if there was a significant correlation the regression shows that there is only a small not significant positive influence of both variables on the effectiveness of the meeting. The fact that this hypothesis was not by the data supported might be due to the fact that this research has a relatively small sample size. Furthermore, there might be a third variable involved between any form of non-verbal behaviour and meeting effectiveness. An example of a third variable that might be involved in between NVB and meeting effectiveness is transformational leadership For example, when a leader is using a lot of expansive body posture this might have an influence on the rating of this leader as a transformational leader. Because, this leader is then a transformational leader this might have a positive influence on meeting effectiveness. As a result of this non-verbal behaviour might have an indirect influence on meeting effectiveness via transformational leadership. This might also be the explanation why hypothesis two was rejected. This hypothesis assumed that an expansive body posture has a positive influence on meeting effectiveness, whereas a constricted body posture has a negative influence. As mentioned before, this hypothesis has been rejected as well. Furthermore, both the variables of the first two hypothesis did not explain much of the variance in meeting effectiveness. Indeed, this might be the case but there might also be another variable that is influence by body posture which influences meeting effectiveness.

Hypothesis 3 and 4 were focused on the linkage of hand gestures with meeting effectiveness. Hypothesis 3 assumed that the usage of more illustrative hand gestures would have a positive influence on meeting effectiveness and hypothesis 4 states that the usage of adaptors has a negative influence on meeting effectiveness. After conducting both a regression analysis and a correlation analysis both hypothesis were not supported. As mentioned before Mandal (2014) states that the usage of self-adaptors is more frequently done by worried

people than by confident people. As a result of this it could be assumed that it has a negative influence on meeting effectiveness. However, the main issue might be that there is a variable missing in this analysis that links hand gestures with meeting effectiveness.

However, when looking at the ANOVA analysis it can be stated that even though there is no significant difference between the means of the 5 leaders that scored the highest on meeting effectiveness and the 5 leaders that scored the lowest. It still shows an insignificant difference in means, this difference supports the hypothesis except for hypothesis 4. An example of this is that thee leaders that scored the highest on meeting effectiveness more frequently had an expansive body posture and were leaning more forward than the 5 leaders which scored the lowest on meeting effectiveness. However this has no effect in whether the hypotheses are rejected or accepted.

What can be concluded after looking at the hypothesis regarding meeting effectiveness is that even though there were no significant correlations found during the research. There is still this missing link.

When looking at the hypotheses regarding pro-active behaviour (H_5,H_6,H_7, and H_8) it becomes clear that after conducting the regression analysis and correlation analysis regarding these hypotheses all hypotheses are rejected. However, one significant correlation and regression has been found. This regression has been found between upward palms and pro-active behaviour. The influence that upward palms has on pro-active behaviour is negative, $r = -.016$, $p < .05$. This is surprising since the literature states that upward palms normally is connected with asking for input by the other people (Kendon 2004, Cesario and Higgins, 2007). This contradictory finding might be explained by the fact that the sample size that has been used is relatively small. Next to this, as mentioned before regarding meeting effectiveness, there might be a third variable involved between non-verbal behaviour and pro-active behaviour.

Like in the case of meeting effectiveness, the ANOVA analysis shows that there is no significant difference between the means of the 5 leaders that scored the highest on the level of the followers' pro-active behaviour and the 5 leaders that scored the lowest regarding pro-active behaviour. However, when looking at the difference in means it can be stated that this supports the hypotheses except for hypothesis 8. An example of the insignificant difference in means is that the 5 leaders which scored the highest on the level of the followers' pro-active behaviour had a more expansive body posture and were leaning forward more than the 5 leaders with the lowest score. However, this does not support the hypotheses and therefore they need to be rejected.

The final hypothesis that has been tested is the hypothesis that linked pro-active behaviour with meeting effectiveness. The hypothesis assumes there is a positive influence of the level of pro-active behaviour on meeting effectiveness. The analysis however, shows that there is no significant correlation between pro-active behaviour and meeting effectiveness. This might be caused by the small sample size or the fact that there is a third variable involved.

As can be concluded from the additional research section. There is a significant influence of meeting effectiveness on both the followers' rating of cognitive trust and affective trust. The influence on both variables is relatively high since the R-square is relatively .314 and .310. This implies that meeting effectiveness explains 31% of the variance in both cognitive trust and affective trust.

5.1 Strengths, limitations and future research directions

The main strength of this analysis is that several sources has been used to conduct this research. This contains the video method research and the several surveys that have been conducted. By using several sources this research has made sure to exclude same method bias. This is important since according to Cote & Buckley (1987) 26.3% of the variance in a research might be due to same method bias.

Even though, there is a strength there are also some limitations regarding this research. The first limitation is the sample size since the sample size that has been used consists of just 20 leader which might result in a less reliable research. However, it has been chosen to analyse a smaller sample more extensive than a bigger sample less extensive. This gives a better and more reliable result of the non-verbal behaviour. Furthermore, the video was recorded in one single organization so this research might not give a valid view regarding the whole population.

Furthermore, the leaders that have been analysed were only recorded one time. This might result in the fact that maybe a leader had a bad day and used therefore less hand gestures than he would normally use.

Another limitation is that this research is not an experiment but an observation. Therefore, a correlation and regression analysis normally cannot be used. However an observation was chosen because there was a higher potential for strong generalizability and external validity of the results.

Further research should mainly concentrate on expanding the sample by analysing more leaders. Next to this, each leader should be analysed more than only one time to see if his non-verbal behaviour throughout the observations is really representative. To make it even more reliable the same observation should be conducted in several different organizations. Furthermore, a close look should be taken on whether there is a third variable present between non-verbal behaviour and both pro-active behaviour and meeting effectiveness. As can be concluded from the additional research section meeting effectiveness has an influence on trust, as a further research more in-depth research regarding this topic can be conducted.

6 Acknowledgements

First of all, I would like to thank my supervisor J.G.W.L. Smits for his support during the period of working on this report. Furthermore, I would like to thank all the other researchers that worked on the same sample of leaders as me. Because without them, we would not have the data we have now and the data would be less reliable.

References

Aragón-Correa, J. (1998). Strategic proactivity and firm approach to the natural environment. Academy Of Management Journal, 41(5).

Baran, B., Shanock, L., Rogelberg, S., & Scott, C. (2012). Leading Group Meetings: Supervisors' Actions, Employee Behaviors, and Upward Perceptions. Small Group Research, 43(3), 330-355.

Bateman, T., & Crant, J. (1999). Proactive behavior: Meanings, impact, and recommendations. Business Horizons, May-June, 63-70.

Baym, N., Zhang, Y., & Lin, M. (2004). Social interactions across media: Interpersonal communication on the internet, telephone and face-to-face. New Media & Society, 6(3), 299-318.

Birdwhistell, R. (1970). Kinesics and context (1st ed.). Philadelphia: Pennsylvania University Press.

Bolino, M., Valcea, S., & Harvey, J. (2010). Employee, manage thyself: The potentially negative implications of expecting employees to behave proactively. Journal Of Occupational And Organizational Psychology, 83(2), 325-345.

Bonaccio, S., O'Reilly, J., O'Sullivan, S., & Chiocchio, F. (2016). Nonverbal Behavior and Communication in the Workplace: A Review and an Agenda for Research. Journal Of Management, XX(1-31), 1-4.

Carney, D., Cuddy, A., & Yap, A. (2010). Power Posing: Brief Nonverbal Displays Affect Neuroendocrine Levels and Risk Tolerance. Association For Psychological Science, XX(X)(1-6).

Carsten, M., Uhl-Bien, M., West, B., Patera, J., & McGregor, R. (2010). Exploring social constructions of followership: A qualitative study. Leadership Quarterly, 21, 543-562.

Cashdan, E. (1998). Smiles, speech, and body posture: How women and men display sociometric status and power. Journal Of Nonverbal Behavior, 22(4), 209-228.

Cesario, J., & Higgins, E. (2008). Making message recipients "feel right" How nonverbal cues can increase persuasion. Physchological Science, 19(5), 415-420.

Clawson, M., Bostrom, R., & Anson, R. (1993). The role of the facilitator in computer-supported meetings. Small Group Research, 24.

Cote, J. A. & Buckley, R. (1987). Estimating trait, method, and error variance: Generalizing across 70 construct validation studies. Journal of Marketing Research, 24, 315-318

Crant, J. (2000). Proactive Behavior in Organizations. Journal Of Management, 26(3).

Darioly, A., & Schmid Mast, M. (2014). The Role of Nonverbal Behavior in Leadership: An Integrative Review (1st ed., pp. 2-8). Hannover: TIB Hannover.

Dethmers, H. (2017). The Role of Nonverbal Behavior in Leadership Effectiveness: A multi-method, video-observational study. Enschede: University of Twente.

Engel, L. (2016). Lending a Hand to Improving Organizational Leadership. In 6th IBA Bachelor Thesis Conference. Enschede: University of Twente.

Engleberg, I., & Wynn, D. (2007). Working in Groups, Communication Principles and Strategies (4th ed.). Pearson Education Inc.

Fritz, C., & Sonnentag, S. (2009). Antecedents of Day-Level Proactive Behavior: A Look at Job Stressors and Positive Affect During the Workday. Journal Of Management, 35(1).

Fuller, B., Marler, L., Hester, K., & Otondo, R. (2015). Leader reactions to follower proactive behaviour: Giving credit when credit is due. Human Relations.

Grant, A., Parker, S., & Collins, C. (2009). Getting credit for proactive behavior: Supervisor reactions depend on what you value and how you feel. Personnel Psychology, 62(1), 31-55.

Hall, J., Carter, J., & Horgan, T. (2001). Status roles and recall of nonverbal cues. Journal Of Nonverbal Behavior, 25(2), 79-100.

Kayser, T. (1990). Mining group gold: how to cash in on the collaborative brain power of a group (1st ed.). El Segundo: Serif Publishing.

Kendon, A. (2004). Gesture: Visible Action as Utterance (1st ed.). Cambridge: Cambridge University Press.

Knapp, M., & Hall, J. (2010). Nonverbal communication in human interaction (7th ed.). Boston: MA: Wadsworth.

Kocsis, D., De Vreede, G., & Briggs, R. (2015). Designing and Executing Effective Meetings with Codified Best Facilitation Practices In The Cambridge handbook on meeting science.. Cambridge: Cambridge University Press.

Mandal, F. (2014). Nonverbal Communication in Humans. Journal Of Human Behavior In The Social Environment, 24(4), 417-421.

Matsumoto, D., & Hwang, H. (2013). Cultural similarities and differences in emblematic gestures. Journal Of Nonverbal Behavior, 37(1), 1-27.

McHugh, m. (2012). Interrater reliability: the kappa statistic.. Retrieved 14 April 2017, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3900052/

Mehrabian, A. (1972). Nonverbal Communication (3rd ed.). New Jersey: Transaction Publishers.

Morrison, E., & Phelps, C. (2017). Taking Charge at Work: Extrarole Efforts to Initiate Workplace Change. Academy Of Management Journal, 42(4), 403-419.

Nixon, C., & Littlepage, G. (1992). Impact of Meeting Procedure on Meeting Effectiveness. Journal Of Business And Psychology, 6(3).

Noldus, L., Trienes, R., Hendriksen, A., Jansen, H., & Jansen, R. (2000). The observer video-pro: New software for the collection, management, and presentation of timestructured data from videotapes and digital media files. Behavior Research Methods, Instruments, And Computers, 197-206.

Remland, M. (1981). Developing leadership skills in nonverbal communication: A situational perspective. Journal Of Business Communication, 18(3).

Rogelberg, S., Leach, D., Warr, P., & Burnfield, J. (2006). " Not another meeting!" Are meeting time demands related to employee well-being?. Journal Of Applied Psychology, 91(1), 83.

Romano Jr., N., & Nunamaker Jr., J. (2001). Meeting Analysis: Findings from Research and Practice. In 34th Hawaii International Conference on System Sciences. Hawaii.

Watson, D., Clark, L., & Tellegen, A. (1988). Development and Validation of Brief Measure of Positive and Negative Affect: The PANAS Scales. Journal Of Personality And Social Psychology, 54(6), 1063-1070.

Zimmerman, P., Bolhuis, J., Willemsen, A., Meyer, E., & Noldus, L. (2009). The Observer XT: A tool for the integration and synchronization of multimodal signals. Behavior Research Methods, 41, 731-735.