Verbal behavioural patterns: Highlighting differences between effective and less effective meetings of agile teams

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ABSTRACT

With markets having to deal more often with a fast pace of change organisations have to become more and more responsive and adaptable. One way to achieve this adaptability, manage change efficiently and become more effective is by adopting the agile way of working. Agile teams consist of self-managing professionals and one Product Owner (PO), responsible for the execution of team priorities. Verbal behaviours can be observed in the interaction between team members and are inevitable within a team working towards a common goal. Behaviours play an important role in influencing the level of meeting effectiveness. This research thus focuses on verbal behavioural patterns being displayed during agile team meetings to explore how they differ between effective and less effective meetings. Frequency analysis, thematic analysis, and statistical methods have been used to explore and observe these differences within the video recordings of the meetings. The analysed data consisted of 11 teams, and 29 meetings are analysed throughout one sprint. The results show that within the planning and refinement meeting individuals participating in effective team meetings display behaviours within the meta-category negative relations more often. Furthermore, effective planning and refinement team meetings are more focussed on the current tasks. For the retrospective meeting, the results are opposite and showed that participants of effective team meetings display less patterns surrounding verbal behaviours characterised as negative relations. The focus of the retrospective meeting is on reviewing the past sprint and the upcoming sprint. This thesis explains the results further and provides both theoretical and practical recommendations for further research.

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Keywords
Agile, Effective team meeting, Meta-category, Patterns, Teams, Themes, Verbal behaviours

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1. INTRODUCTION

Markets in which organizations operate are not fixed and are characterised by a fast pace of change. Such rather turbulent and volatile markets are becoming more and more the norm (Christopher, 2000). Hence, for a company to stay relevant and survive it is key to be flexible, responsive, and adaptable, responsiveness within a market has been termed agility (Christopher, 2000).

Within the business environment, agile ways of working have been developed to accept and efficiently manage change (Highsmith & Cockburn, 2001). Agile methods have been increasingly popular because organisations adopting agile seem to be more effective and agile teams are associated with higher job satisfaction, lower turnover, and lower absenteeism (Moe et al., 2009).

What further supports the movement towards the adoption of agile teams is that it leads to high productivity, quality, and effectiveness (Kirkman & Rosen, 1999).

Team meeting effectiveness, which depicts whether a team can produce desired results (Bergner, 2010), comes forth out of team learning, achieving common goals, and team learning behaviours (Raes et al., 2015). Team learning behaviours are an interaction process based on activities in which members acquire, share, refine, or combine task-related information (Van Der Vegt & Bunderson, 2005). One of the factors that may influence team meeting effectiveness is related to team members' verbal behaviours, a form of communication based on language, displayed by the individual team members (Hoogeboom et al., 2021). Within team meetings individuals share their vision, a meaning, an idea, or a proposal with the other members of the team, these are observable verbal behaviours (Raes et al., 2015). Previous research established that there is a relationship between the level of sharing within a team and the level of team effectiveness (Raes et al., 2015). Yet, this research has not focussed specifically on an agile setting and has not looked at how verbal behavioural patterns can influence team meeting effectiveness. Many studies researching behaviours are formed around differences in demographic characteristics, values, or research access (Zhao et al., 2019). Little research is available on the level of meeting effectiveness and verbal behaviour patterns. To build on the existing research available about agile teams and behaviours influencing effectiveness, this research looks at how verbal behavioural patterns displayed during meetings of agile teams are related to the level of effectiveness.

1.1 Research Objective and Research Question

Therefore, this research strives to create insights into the relationship between verbal behaviours and team meeting effectiveness in agile teams. The main objective is to identify possible patterns in verbal behaviours that could distinguish effective agile teams from less effective agile teams.

The overarching research question that stands central in this thesis is:

How do verbal behavioural patterns differ between effective and less effective meetings of agile teams?

To address this research question, sub-research questions are formulated.

Sub-research question 1: How do verbal behaviours differ between effective and less effective teams and between different types of meetings?

Sub-research question 2: How do behaviours and behavioural patterns differ between product owners of effective and less effective teams and different types of meetings?

1.2 Academic and Practical Relevance

1.2.1 Academic Relevance

This research contributes to the current literature on agile teams and literature on verbal behaviours by recognising those verbal behavioural patterns displayed by individuals in agile teams impacting the level of meeting effectiveness. Connecting certain behavioural patterns to the level of team meeting effectiveness in agile teams could contribute to the existing knowledge in the business and management environment. Furthermore, it could be a starting point for further research relating to key behavioural patterns influencing team meeting effectiveness.

1.2.2 Practical Relevance

By exposing verbal behaviour patterns that possibly influence effectiveness within agile teams, team members could become more aware of elements that could impact and explain their current state of effectiveness. The agile teams might be able to build on the results of the research by assessing, adjusting, and promoting certain patterns in verbal behaviour to stimulate higher effectiveness within the agile team.

1.3 Outline of the Thesis

The following section in the report is the theoretical framework, where the literature on known concepts is discussed. How the research is performed, measured, and the data is analysed is explained in the following section, the methodology. Afterwards, the results are reported and discussed. Based on the results and the discussion, strengths, and limitations of the research performed and recommendations for future research are mentioned. Lastly, in the conclusion, the research question is answered.

2. THEORETICAL FRAMEWORK

This part of the report starts with a review of the existing literature about agile principles in teams and team meeting effectiveness. Afterwards, verbal behaviours, and behavioural patterns are discussed.

2.1 Agile Principles in Teams

Agile is a change-driven concept originating from the software and IT industry (Moe et al., 2009) and was initially designed for use in small, single-team projects (Dikert et al., 2016). Agile methods differ from traditional methods since they are designed to accept and efficiently manage change, while traditional methods focus on up-front planning and strict management of change (Highsmith & Cockburn, 2001). Agile methods can be defined as change proficiency that creates the ability to respond quickly to rapidly changing markets through continuous and unanticipated change (Krishnamurthy & Yauch, 2007). Successfully implementing agile within an organisation may result in flattening the organizational structure, meaning that the decision-making power is distributed within the hierarchy structure (Magpili & Pazos, 2017). Within this horizontal organisational structure, teamwork plays an important role.

Teamwork can be defined as a set of values that encourage listening and responding constructively to others' views and expressions, giving the benefit of the doubt, supporting team members, and recognizing the interest and achievements of team members (Moe et al., 2009). Agile teams also called squads, are cross-disciplinary and self-organised groups and refer to individuals that manage their workload, coordinate the work among themselves based on need and best fit, and participate in team decision-making (Hoda et al., 2013).

These individuals in agile teams can be referred to as self-managing professionals who come together during meetings (Moe et al., 2009). Inherently, the leadership in agile teams consisting of self-managing professionals is distributed or shared compared to traditional centralized leadership (Hoda et al., 2013). Agile teams do have one person, the Product Owner, who is responsible for the execution of the team priorities. In general, each agile team performs three meetings, a planning meeting, a meeting focused on refinement, and a retrospective meeting. Planning and refinement are more focussed on the current tasks, while the retrospective meeting reflects on the sprint.

The adoption of agile methods in teams can influence the level of team meeting effectiveness (Hoda et al., 2013).

2.2 Team Meeting Effectiveness

Team effectiveness can be defined by certain predictors of a group or team, which relate to the cognitive property of a group and efficient movement through cycles (Gibson et al., 2009). The level of effectiveness is dependent on the performance judged by parties external to the team and a dynamic process can be defined as a concept consisting of three aspects namely whether team members' needs have been met, the viability of the team, and the willingness of members to remain part of the team (Kzolowski & Ilgen, 2006). The parties who have an interest in how well a team is performing could be stakeholders, other teams, and customers (Mathieu et al., 2018). A team's process can influence the level of effectiveness, the processes relate to performance, achievement of tasks, interaction within the team, interpersonal skills, and self-management skills, to attain desired outcomes (Salas et al., 2005). Another way to define team effectiveness is based on outcomes, tangible outcomes, and intangible outcomes (Mathieu et al., 2018). The tangible outcomes can be further described as the productivity, efficiency, and quality of a team (Mathieu et al., 2018). The intangible outcomes can be defined as influences on team members, cohesion, psychological safety, learning behaviours, attitudes, and reactions (Mathieu et al., 2018). Factors influencing a team's outcomes and thus the level of effectiveness are the display of behaviours relating to conflict and consensus in a team (Gibson et al., 2009). Furthermore, behaviours relating to potency, meaningfulness, impact, agility, and autonomy also influence the level of effectiveness (Kirkman & Rosen, 1999).

Meetings can be defined as work-related interactions that are purposeful and occur with two or more individuals and have more structure than a chat, but less than a lecture and are usually scheduled in advance with an approximate duration known from the beginning (Rogelberg et al., 2010). During these meetings, the individuals participating are interacting with each other, and there is social contact, coming forth out of the display of behaviours, that influences the level of effectiveness (Rogelberg et al., 2006). This research views effectiveness from a team meeting perspective thus the terms team meeting effectiveness and team effectiveness are used interchangeably. The definition of team meeting effectiveness in this research comes forth out of the definition based on tangible and intangible outcomes (Mathieu et al., 2018). What factors influence team meeting effectiveness is discussed in the next paragraphs

2.3 Verbal Behaviours

Factors influencing the outcomes of meeting effectiveness are behaviours. Behaviours can be defined as an attempt by an individual to bring about desired outcomes and a state of affairs (Bergner, 2010). A distinction can be made between verbal and non-verbal behaviours, within this research, the focus is on verbal behaviours. Verbal behaviours can be observed in the interaction between team members and are inevitable within a team working towards a common goal (Raes et al., 2015). Observable verbal behaviours have to do with sharing information, sharing a vision, a meaning, an idea, or a proposal to team members who are unfamiliar with the aspect (Raes et al., 2015). Sharing within the team is a starting point toward learning behaviours such as co-construction and constructive conflict (Raes et al., 2015). Learning behaviour supports the creation of team synergy and can transcend to team effectiveness (Raes, et al., 2015).

Research exploring verbal behaviours in leaders has shown that three meta-categories can enhance effective leadership (Yukl et al., 2002). The three meta categories are task-, relationship-, and change-oriented behaviour (Yukl et al., 2002). Task-oriented behaviour refers to a high level of efficiency in the use of available resources and personnel, and high reliability within operations, products, and services (Yukl et al., 2002). Converted to verbal behaviour, this means task-related behaviour in which the individuals are not explicitly addressed (Hoogeboom et al., 2021). Relation-oriented behaviour refers to a high level of mutual trust, cooperation between members, commitment to the unit, and its mission (Yukl et al., 2002). Hogeboom translates this to communication that addresses the person in a way that strengthens their experience of self-determination and empowerment (Hoogeboom et al., 2021). Lastly, change-oriented behaviour refers to innovative improvements and the level of adaption to changes in the external environment (Yukl et al., 2002).

Each behavioural type can influence more than one type of outcome, for example behaviours aimed at a positive outcome can have a negative side effect (Yukl, 2012). This could be explained by most research focussing on individual behaviours, however, behaviours often lead to a certain result due to the mutually consistent way behaviours interact (Yukl, 2012). This draws on the importance of focusing on and recognising behavioural patterns instead of individual behaviours. Through innovative research methods, video-based observation, verbal behaviours displayed by individuals are researched more objectively.

2.4 Behavioural Patterns

A pattern, a complex tapestry of behaviours, is usually more important and various patterns could lead to the same or different outcomes (Yukl, 2012). Yukl et al. (2002) mentioned that each behaviour must be directly observable, for exploring verbal behavioural patterns in this research the same principle is important for exploring verbal behavioural patterns displayed during team meetings.

The explored verbal behavioural patterns could lead to team reflexivity, which means the cause and effect of certain verbal behaviours displayed by the individual team members (Raes et al., 2015). Keeping the common goals within the team central, while actively engaging in reflexivity creates shared cognition. Because the team's actions are coming forth out of the awareness of the common goal, they are potentially impacting their level of effectiveness. Team reflexivity and recognizing verbal behavioural patterns can be seen as a process of loop learning within the team (Raes et al., 2015). Yet, since this topic is still rather unexplored given the scarcity of studies on verbal behaviours, the focus of this thesis is on behavioural patterns and how they are associated with the level of meeting effectiveness.

3. METHODOLOGY

An exploratory study has been performed to see whether there are visible differences in verbal behavioural patterns and the level of effectiveness in team meetings. This research used a mixed-method approach towards research that includes a combination of quantitative and qualitative analyses (Burke Johnson et al., 2007). Applying a mixed-method design aids in

the interpretation of data and facilitates the use of various data collection methods and research strategies (Saunders et al., 2009). The use of both quantitative and qualitative methods provides a more inclusive picture of the data collected (Beck, 2014). The mixed-method approach is liable to the constraints of the method, this affects the results but it is impossible to ascertain the nature of the effect (Saunders et al., 2009).

3.1 Data Collection

The data used in this research has been collected during research performed by the Organisational, Behaviour, Change Management and Consultancy (OBCC) department of the University of Twente at a service organization in the Netherlands that adopted the concept of agile a few years ago. The data available includes surveys, video recordings of the three meetings performed by an agile team, namely planning, refinement, and retrospective meeting, as well as arousal data during the meetings of the individuals within the teams. The focus of this thesis is on the use of the survey, and video materials. The surveys have allowed the data collectors to gather information about how the individuals in a team have perceived certain aspects of the meetings. The video material allows for insight into how agile teams operate and what dynamics play a part. Therefore, it is an opportunity to explore verbal behavioural patterns that are displayed during the recorded meetings. In total data has been collected on eleven agile teams each one performing three meetings. However, two teams did not perform all three meetings, but two out of three, resulting in 29 meetings. Meetings were either held online or onsite and out of the eleven teams 9 teams had held their meetings onsite and 2 teams held their meetings online. The duration of the meetings held by the different teams varied around an hour.

3.2 Sample

The data collection for the surveys has been at the individual level. The individuals in the agile teams that stood central in this research contain different backgrounds, both cultural and educational. The eleven teams consisted of a minimum of 5 and a maximum of 10 people, with a mean of 7,73 (SD=1,74). Exploring the data resulted in finding out that in total 76 rated the planning meeting concerning (perceived) meeting effectiveness. For the meeting relating to refinement 64 individuals filled in the survey. A noteworthy comment relating to the large number of individuals characterised as missing is that one team did not perform the meeting and therefore their data is missing. For the retrospective meeting, 60 individuals who are part of the different teams took part in the survey and answered the question concerning meeting effectiveness, and again one team did not perform the meeting. The number of individuals that have been analysed via the results coming forth of video observation for each meeting category is planning: 70, refinement: 60, and retrospective: 65. Most teams have one Product Owner, but two teams within the sample do not. Furthermore, Product Owners are not always present in every meeting, resulting in having a small sample. For the planning meeting the number of Product Owners is 8, refinement 4, and retrospective there are 8. Questions related to the demographics of the team members have only been asked in the first survey, meaning some individuals have been excluded. However, from the 85 individuals listed as a team member during the planning meeting, 79 answered the questions related to age and 79 answered the questions related to gender. In total there are 78 valid answers, meaning they answered both questions in the survey. The mean age of the individuals participating in the survey is 39,18 years (SD=9,98) and from the valid data, we could derive that 79,7% are male and 20,3% female.

3.3 Research Instruments

3.3.1 Verbal Behaviours

The collected data consists of video recordings of the meetings held by the different agile teams. These video recordings and the verbal behaviours displayed are coded by two independent coders using a codebook (Wilderom, 2021). The behavioural codes mentioned in the codebook are mutually exclusive. Given the exploratory nature of this thesis, the focus is on a wide set of behaviours to prevent exclusion and disadvantageous effects on the uncovering of behavioural patterns. The verbal behaviours that stand central in this research to explore behavioural patterns are defined in Appendix 10.1. All behaviours are analysed, but 'Rest category' is not used to explore patterns due to its varying nature and being a small portion of the data. The Analysis is formed around the frequencies of individual verbal behaviours that can be seen as interdependent acts that convert inputs to outcomes (Van Dun & Wilderom, 2021). Within this research, the duration of the behaviours is not taken into consideration due to time constraints. However, next to the frequency the meta-category, as conceptualised by Hoogeboom et al. (2021), is added for each verbal behaviour, see Appendix 10.1. The aim of taking the meta-categories into consideration is to see from what type of meta-category the differences in behavioural patterns between effective and less effective meetings stem.

3.3.2 Behavioural Patterns

The starting point for the exploration of verbal behavioural patterns are the differences in the verbal behaviours between effective and less effective team meetings that are displayed within the different meeting types. The following step is to look for patterns around behaviours that showed meaningful differences. A sequence consisting of three consecutive verbal behaviours resulting in a pattern worth researching if the pattern is repeating itself various times during meetings, in other meetings, or when they are visible in other teams as well. The patterns that are uncovered are linked to the level of meeting effectiveness to see if there is a difference between certain patterns occurring and the level of meeting effectiveness. Because each team has three meetings with different objectives it is expected that during the different kinds of meetings different behavioural patterns are being displayed.

3.3.3 Meeting Effectiveness

Team meeting effectiveness was measured after each meeting on a 4-item scale that was self-developed by taking inspiration from Engleberg and Wynn's (2007) and Baran et al.'s (2012) meeting effectiveness scales. The scale is anchored at 1 = *Strongly Disagree* and 7 = *Strongly Agree*. Items are 1) 'The meeting was effective', 2), 'Our meeting was productive', 3) 'The meeting I attended was worth my time' and 4) 'The past squad meeting was efficient'. The overall score of team meetings is between 1 and 7, 1 meaning *extremely ineffective* to 7 meaning *extremely effective*. Within this research, the distinction is made between effective teams and less effective team meetings. Therefore, the mean team meeting scores coming forth out of the survey are translated into a dichotomous variable with the values effective and less effective.

3.4 Data Analysis

After the initial coding of the meetings, the results form the basis and can be used to explore verbal behavioural patterns. The potential patterns have been uncovered by 1) dichotomizing (perceived) meeting effectiveness, 2) content analysis, 3) a preliminary focus established by performing statistical tests on the individual verbal behaviours, 4) and the thematic analysis on the sequences surrounding the verbal behaviours that show largest differences. Within this process a combination of quantitative and qualitative methods is used, and the order of the methods is intertwined.

3.4.1 Quantitative Analysis

The quantitative part of this research refers to dichotomizing the variable (perceived) meeting effectiveness, standardising the results from the frequency count, and the statistical tests. For the dependent variable (perceived) meeting effectiveness, the researchers from the department OBCC have already calculated the mean score per team meeting held by the different squads. Dichotomizing the variable has been done by looking at the median, minimum, and maximum per meeting category. Because team meeting effectiveness is the dependent variable, behavioural patterns displayed by the individuals of a team during meetings are considered to be the independent variable.

Verbal behaviours are measured in frequencies, to be comparable they have to be standardised. This has been calculated by taking the frequency divided by the duration of the meeting in seconds. Before performing the statistical test, a two-sample T-test or a Mann-Whitney U, for each behaviour per meeting category for all individuals and solely product owners, the Shapiro-Wilk test has been performed to check the normality assumption. The hypotheses are; H0: the data is normal and HA: the data is not normal. Furthermore, an alpha of 0,05 is used to allow a minimal risk of 5%. In case the data does not fall within the acceptable range a log transformation can be performed to filter out the individuals that influence the ability to compare the outcomes negatively. Based on the result after log transformations, either a two-sample T-test or a Mann-Whitney U test is performed. The following hypotheses for these tests are created. H0: the mean of the variable is equal for individuals of effective and less effective team meetings. HA: the mean of the variable is significantly different between individuals of effective and less effective team meetings. In case a parametric test is performed also Levene's test is performed to analyse the variances. The hypotheses are; H0: equal variances can be assumed; HA: equal variances cannot be assumed. These various tests accept a risk of 5%, meaning an alpha of 0.05. Differences displayed within the comparisons of the mean are used as the foundation for the exploration of verbal behavioural patterns.

3.4.2 Qualitative Analysis

The qualitative analysis within this research starts with coding the meetings. Within the process of exploring verbal behaviour patterns, it refers to the content analysis that forms the foundation for the statistical tests, the qualitative part of establishing a preliminary focus, and the thematic analysis. First, a content analysis (i.e. frequency count) is performed to see how often the various verbal behaviours are displayed. Secondly, the results from the statistical tests concerning verbal behaviours are reviewed interpreting the differences in mean, rank, and the meta-category. Due to the small sample size of the Product Owners the rank for the individuals is used solely to explore differences. The result of this interpretation sets the foundation for the thematic analysis by establishing a selection of verbal behaviours to perform the thematic analysis on. In consequence, the thematic analysis is used to narrow down the previously established focus resulting from the content analysis and the statistical tests. This method helps identify, analyse, and report patterns within data based on a guide consisting of six steps (Braun & Clarke, 2006). A theme can be defined as a patterned response displayed within the data set and in relation to the research question. A strength of using this method is that its theoretical freedom results in flexibility and can provide a rich, detailed, and complex account of data. A disadvantage of thematic analysis is that the interpretative power of this method is limited to description (Braun & Clarke, 2006).

The six phases of the thematic analysis consist of are as follows. First familiarize with the data by transcribing, reading, and writing down initial ideas. The second phase focuses on generating codes and coding features in the whole data set systematically. Thirdly searching for themes by collecting codes and gathering all relevant data for a potential theme. The fourth phase refers to reviewing themes on two levels, the first level checks whether the themes work with the coded extract and the overall data set, and the second level generates a map of the themes analysed. The following phase is defining and naming the identified themes, within this process specifics are refined and analysis is performed to establish what the overall story is of the analysis. Lastly, the sixth phase is where the final report of the thematic analysis is created taking into consideration examples, the analysis of the selected extracts, referring to the research question, and combining it into a report (Braun & Clarke, 2006).

4. RESULTS

4.1 Quantitative Results

4.1.1 Meeting Effectiveness

The results come fort of 29 team meetings that are rated on a scale from one to seven. Overall, the minimum score of team meeting effectiveness is 3,6, the maximum 6,3, an average of 5,44, a median of 5,7, and a mode of 5,8. Because each team performs three different kinds of meetings, dichotomizing the variable (perceived) meeting effectiveness is performed per meeting category to be able to make it comparative. Table 1 shows the characteristics relating to (perceived) meeting effectiveness concerning different kinds of meetings. To decide whether a meeting was effective or less effective, the median values per category have been used as a cut-off point. The median is selected because it is less sensitive to outliers compared to the mean. For the exploration of verbal behavioural patterns, 29 meetings are considered. Of those meetings 14 are characterised as effective and 15 as less effective meetings. The distribution per category of meetings has been shown in Table 2 and shows that the distribution for the refinement meeting is equal. For the Product owner the distribution over the various meeting categories is unequal. Planning has for both 4 Product Owners part of an effective team meeting and part of a less effective team meeting. Refinement, on the other hand, has 1 Product Owner part of an effective team meeting and 3 part of a less effective team meeting. Within the retrospective category 3 Product Owners are researched that are part of an effective team meeting and 4 Product Owners that are part of a less effective team meeting.

Table 1

(Perceived) Meeting Effectiveness Scores

Characteristics planning	**Scores**
Min	4.5
Max	6.3
Median	5.7
Mean	5.57
Mode	6.2
Characteristics refinement	**Scores**
Min	3.6
Max	6.3
Median	5.45
Mean	5.32
Mode	5.9
Characteristics retrospective	**Scores**
Min	4.4
Max	5,9
Median	5.65
Mean	5.42
Mode	5.8

Table 2

Meeting Count per Category

	Effective	**Less Effective**
Planning	5	5
Refinement	4	5
Retrospective	5	5
Total	14	15

4.1.2 Verbal Behaviours

When checking for normality in the planning meeting, the data turned out to be not normally distributed. However, the results coming fort of the normality test are not concrete for the variable *active listening*, a log transformation is performed to see whether a parametric test can be performed. The results of the normality test of the log transformation showed that the distribution is not normal. Therefore the Mann-Whitney U Test is performed to see whether there are differences between verbal behaviours in effective and less effective meetings. The results from the Mann-Whitney U Test show that there are differences in the mean rank of verbal behaviours between individuals within effective and less effective team meetings. The test shows that for the variables *Defending one's own position, Humour, Giving direction/ own opinion, Giving direction/ long term, Governing/ Interrupting,* and *Professional challenging/ stimulating teamwork* the null hypothesis can be rejected because the difference between effective and less effective meetings is significant.

For the refinement meeting the Shapiro-Wilk test performed with the data of the individuals resulted in one variable, *active listening*, being normally distributed, and for the other verbal behaviours normality cannot be assumed. Therefore, for *active listening* a two-sample T-test is performed and for the other variables a Mann-Whitney U Test. Next to a two-sample T-test also a Levene's Test has been performed for *active listening*. The value of the Levene's test shows that the p-value is larger than alpha 0.05 thus equal variances can be assumed. The hypothesis for the two-sample T-test and the Mann-Whitney U Test are the same. H0: the mean of the variable is equal for individuals of effective and less effective team meetings. HA: the mean of the variable is significantly different between individuals of effective and less effective team meetings. With an alpha of 0,05, the results from the two-sample T-test are insignificant, meaning there is not enough evidence to reject H0. The Mann-Whitney U Test shows differences in rank, and the mean is significantly different for the variables *Informing with facts, Focussed task behaviour, Rest category, Governing/ delegating, Humour,* and *Sharing personal information.*

Checking for normality in the retrospective meeting through the same hypotheses shows that there is not enough evidence to assume normality for any of the variables. Resulting in having to perform the Mann-Whitney U Test. The results from the Mann-Whitney U test show the difference in rank for who the hypotheses can be rejected. The variables for which the null hypotheses are rejected are *Governing/ Interrupting, Active listening,* and *Giving direction/ own opinion*.

Testing for normality for the combined data of the three meetings also showed that there was not enough evidence to reject H0. The Mann-Whitney U Test shows a significant difference in effective and less effective for the variables *Shaping the discussion, humour, Sharing personal information, and rest category*, see Appendix 10.2.

Within each meeting, the product owners are also analysed. Across the different meeting categories, various behaviours met the condition for normality, see Table 8, for those behaviours a two-sample T-test is performed. For the other behaviours a Mann-Whitney U test has been performed. For the planning meeting performing statistical tests on the Product Owners resulted in fewer behaviours being significantly different in mean. However, one behaviour *Professional challenging/ Stimulating teamwork* is and is displayed more often by Product Owners of effective team meetings. The refinement meeting did not show any significant difference in the mean of the verbal behaviours in relation to the Product Owners. The retrospective meeting on the other hand did show that the mean is significantly different for the behaviour *Agreeing* and thus more often displayed by Product Owners of less effective team meetings.

4.2 Qualitative Results

4.2.1 Verbal Behaviours

The mean rank, displayed in Table 6, shows that certain behaviours throughout all meeting categories are more often displayed by individuals of either effective or less effective team meetings. *Shaping the discussion*, and *Giving positive attention/ being friendly* are both more often displayed within less effective team meetings. The behaviours *Sharing personal information*, and *Rest category* are more often displayed by the individuals of effective team meetings.

Next to that, Table 6 shows that the behaviours *Defending one's own position, Agreeing, Governing/ delegating, Verifying, Informing with facts, Giving positive feedback, Humour,* and *active listening* are more often displayed by individuals of effective team meetings within planning, refinement, and combined meeting data. However, within the retrospective meetings these behaviours are all more often displayed by individuals participating in less effective team meetings. For the behaviours *Giving direction/ long term*, and *Professional challenging/ Asking for ideas* the same happens but oppositely, meaning the behaviours are more often displayed by individuals of less effective team meetings within planning, refinement, and combined meeting data, but for retrospective, it is more often displayed by individuals of effective team meetings.

Furthermore, the behaviours *Disagreeing, Governing/ correcting,* and *Giving Positive attention/ showing personal*

interest is more often displayed by participants of less effective team meetings within planning but are more frequently displayed by participants of effective team meetings for the other meeting categories. For the behaviours *Governing/ interrupting*, *Giving direction/ own opinion*, and *Focussed task behaviour* the opposite happens. Thus the behaviours are within the planning meeting more often displayed by participants of effective team meetings and in the other meeting categories more often by participants of less effective team meetings.

Three behaviours do not fit in the three previously established separations, these behaviours are *Showing disinterest*, *Giving negative feedback*, and *Professional challenging/ stimulating teamwork*. *Showing disinterest* is more often displayed by participants of effective team meetings within the categories refinement and combined meeting data, within the planning, and the retrospective meeting participants of less effective teams meetings have displayed it more often. *Giving negative feedback* is in general more often displayed by participants of less effective team meetings except for the meeting category refinement. *Professional challenging/ stimulating teamwork* is more often displayed by participants of effective team meetings within the categories planning and combined meeting data. The other two meeting categories show that the behaviour is more often displayed by participants of less effective team meetings.

For the exploration of patterns, a sample of ten behaviours per meeting category is chosen because within the timeframe of the research not all could be researched.

The preliminary focus for exploring patterns is established by looking at the various results coming forth from the statistical test and the overlap between the different meeting categories. The behaviours that are significantly different in the meeting categories and for which the individual rank showed interesting results are selected for comparison. These behaviours are *Defending one's own position, Humour, Agreeing, Giving direction/ long term, Governing/ delegating, Professional challenging/ asking for ideas, verifying, informing with facts, Giving positive feedback*, and *Active listening*. Table 3 shows how these behaviours have been distributed across the different meeting categories and the behaviours are linked to the corresponding meta-category.

Table 3

Distribution Focus Behaviours, Rank and Meta-category

Planning		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Higher rank	Effective	Effective	Effective	Less effective	Effective	Less effective	Effective	Effective	Effective	Effective
	Meta-category	Negative relations	Positive relations	Task	Task	Task	Positive relations	Task	Task	Positive relations	Listening
Refinement		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Higher rank	Effective	Effective	Effective	Less effective	Effective	Less effective	Effective	Effective	Effective	Less effective
	Meta-category	Negative relations	Positive relations	Task	Task	Task	Positive relations	Task	Task	Positive relations	Listening
Retrospective		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Higher rank	Less effective	Less effective	Less effective	Effective	Less effective	Effective	Less effective	Less effective	Less effective	Less effective
	Meta-category	Negative relations	Positive relations	Task	Task	Task	Positive relations	Task	Task	Positive relations	Listening
Meeting data combined		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Higher rank	Effective	Effective	Effective	Less Effective	Effective	Less effective	Effective	Effective	Effective	Effective
	Meta-category	Negative relations	Positive relations	Task	Task	Task	Positive relations	Task	Task	Positive relations	Listening

4.2.2 Verbal Behaviour Patterns

The differences resulting from the statistical tests and the differences in rank established a set of behaviours to focus on. Around this set of behaviours sequences consisting of three verbal behaviours have been explored.

Results from exploring the sequences within the different meeting categories and the combined meeting data show that certain behaviours within the sequences can be grouped. For certain categories repetitions is more common than others. The noticeable results are that the behaviour around which the sequence is focused is displayed more often within the sequence. In other sequences behaviours seem to trigger a more active reaction as *Governing/ interrupting*, *Governing/ delegating*, *Verifying*, *Giving direction/ own opinion*, or *Informing with facts*. On the other hand, some sequences have a more passive nature, referring to behaviours such as *Active listening*, *Showing disinterest*, and *Agreeing*. The three created themes for this research are repetition of focus behaviours (A), active response (B), and passive response (C).

The table below shows the most frequent reoccurring sequences defined in themes. The table shows that there are differences in the nature of the patterns occurring around a focus behaviour per meeting category. Combining the data of all meeting categories but separated in the level of meeting effectiveness resulted in fewer noticeable differences. What is surprising about the established themes is that behaviours characterised as positive relations are merely being included.

The results also seem to show the same difference in the behaviour *Defending one's own position*. Furthermore, the behaviour *Giving direction/ long term* is not frequently enough displayed by individuals of effective team meetings within planning and refinement to explore themes.

The noteworthy differences for the refinement meeting are similar, and *Giving positive feedback* does not repeat itself often within the same sequence within but *Governing/Delegating* does within less effective team meetings.

The retrospective meetings show that the behaviour *Defending one's own position* is not frequently repetitioned within the same pattern, but it is within less effective meetings. For *Giving direction/ Long term* effective meetings also display it more often and an active response is often given or a passive response. Furthermore, *Governing/ delegating* does not often show repetition of behaviour within less effective team meetings, and *active listening* displays a passive response as well. Combining the data seems to smoothen out the differences in themes. However, *Giving positive feedback* is not often repetitioned within Less effective meetings.

Table 4

Exploration Patterns within Meeting Categories

Planning		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Effective	A,B,C	A,B,C	A,B,C	-	B,C	B,C	B,C	A,B,C	B,C	A,B
	Less effective	B,C	A,B,C	A,B,C	B,C	B,C	B,C	B,C	A,B,C	B,C	A,B
Refinement		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Effective	A,B,C	A,B,C	A,B,C	-	B,C	B,C	B,C	A,B,C	A,B,C	A,B,C
	Less effective	B,C	A,B,C	A,B,C	B,C	A,B,C	B,C	B,C	A,B,C	B,C	A,B,C
Retrospective		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Effective	B,C	A,B,C	A,B,C	B	A,B,C	B,C	B,C	A,B,C	B,C	A,B
	Less effective	A,B,C	A,B,C	A,B,C	B,C	B,C	B,C	B,C	A,B,C	B,C	A,B,C
Meeting data combined		**Defending one's own position**	**Humour**	**Agreeing**	**Giving direction / long term**	**Governing/ delegating**	**Professional challenging/ Asking for ideas**	**Verifying**	**Informing with facts**	**Giving positive Feedback**	**Active listening**
	Effective	A,B,C	A,B,C	A,B,C	B,C	B,C	B,C	B,C	A,B,C	A,B,C	A,B,C
	Less effective	A,B,C	A,B,C	A,B,C	B,C	B,C	B,C	B,C	A,B,C	B,C	A,B,C

5. DISCUSSION

5.1 Theoretical Implications

5.1.1 Verbal Behaviours Individuals

For the behaviours that have a higher rank for either individuals of effective or less effective team meetings throughout all meeting categories, it is visible that two of the behaviours are characterised as positive-relations and one as task. Sharing in the form of *Giving positive feedback*, and *Giving positive attention/ being friendly* in itself do not lead to learning behaviours that contribute to the level of meeting effectiveness (Raes et al., 2015). The assumption can be made that even though the character of the behaviour they result in a certain way due to the mutually consistent way behaviours interact (Raes et al., 2015).

Within this research the behaviour *Giving direction/ long term* is hardly displayed by participants of effective teams within the planning and refinement meetings. However, this behaviour has been displayed by participants of less effective team meetings within planning and refinement. The peculiar aspect is that this behaviour is considered task-related, meaning it contributes to the level of efficiency within a team meeting. In addition, various other focus behaviours are portrayed similarly within the planning and refinement meeting, but opposite within the retrospective meeting regardless of what meta-category can be linked to the behaviour. An explanation for the results, referring to the higher rank, in relation to the behaviours considered and why they are similar for the planning and refinement meeting, but opposite for the retrospective meeting. This appearance could come from the nature of the meeting. The meeting types planning and refinement are happening at the beginning and during the sprint, while the retrospective meeting reflects on the previous sprints.

The refinement meeting displays a significant difference in mean for the behaviour *Focussed task behaviour*, which is displayed more often within less effective team meetings. The latter is also the case for the retrospective meeting and the combined data. Even though this behaviour is task-related and contributes to the level of efficiency it is a behaviour that focuses on the individual instead of the group. Therefore, the assumption can be made that it contributes to the individual rating of (perceived) meeting effectiveness, but not to how the team perceives it.

5.1.2 Verbal Behaviours Product Owners

The results for the Product Owners did not stand out in comparison to the results of the individual data. A reason could be that there is horizontal sharing of influence and responsibility between the team members of agile teams whereby they lead each other toward goal achievement (Scott-Young et al., 2019). The Product Owner supports this process, which is visible within the planning meeting where effective Product Owners displayed *Professional challenging/ stimulating teamwork* more often. A behaviour that promotes mutual trust, cooperation, and commitment to the squad (Yukl et al., 2002).

5.1.3 Verbal Behavioural Patterns

Incorporating the research performed by Yukl et al. (2002) and Hoogeboom et al. (2021) can explain the themes coming forth out of the thematic analysis further. The first theme 'Reoccurring of the focus behaviour' is a theme that can be linked to a meta-category by looking at the behaviour around which the theme revolves. For the theme 'active response' refers mostly to task-related behaviours, however, Governing/ interrupting is characterized as negative relations. Therefore, this theme aims at increasing efficiency by displaying behaviour in which individuals are not explicitly addressed. Nevertheless, the incorporation of the behaviour Governing/ interrupting in this theme says that the individuals are acting from their commitment to the mission, but instead of empowering others, they feel the need to express their thoughts on the matter assuming they think it will contribute to the goal but not realising how it will affect the group dynamics. The third theme 'Passive response' is again related to task-related behaviours and negative relations-oriented behaviours. Meaning individuals are passively or in a minimal way willing to contribute to an efficient meeting. However, by showing disinterest individuals are not absent, but also not trying to improve the condition of the meeting. No matter the aim of the behaviour.

The research of Yukl (2012) explains that behaviours aimed at a positive outcome can have negative side effects. However, patterns revolving around a negative focus behaviour can overall have an outcome associated with a higher level of meeting effectiveness, perhaps in relation to the nature of the meeting type and the mutually consistent way behaviours interact (Raes et al., 2015). The following assumption can be made, behaviours that are considered to be negative, can contribute to a positive outcome and are displayed more often within effective meetings when it helps speed up the process towards task-related behaviours that increase the level of effectiveness. Secondly, the meetings planning and refinement are more focussed on the present, therefore the assumption that the behaviour Giving direction/ long term does not add to the current state of affairs can be made. This would also explain why within the retrospective meeting the results are opposite because the focus of the meeting is looking back at the accomplishments and the pitfall of the current sprint to learn and adapt for the next sprint. Therefore the behaviours associated with negative relations can be disruptive and actively discussing the future is beneficial.

5.2 Practical implications

Based on the findings of this research some practical implications are developed. Because Product Owners aid by supporting the processes within the squad the behaviours their display should be in line with the description of what the Product Owner entails.
Raising awareness to behavioural patterns instead of focussing on individual behaviours should be stimulated. The display of individual behaviours characterised as negative-relation might contribute to the level of effectiveness because they are part of a pattern that is associated with a higher level of (perceived) meeting effectiveness.

6. STRENGTHS, LIMITATIONS, AND FUTURE RESEARCH

6.1 Strengths

Strengths pertaining to this research refer to the unique way this research has been conducted and how over several years the data has been collected. Furthermore, the meetings are coded in a reliable and objective way by two independent students using a codebook with mutually exclusive behaviours. By using the codebook the students created two different event logs to, later on, do a reliability analysis, meaning reviewing the coded observation again.
To explore patterns the event logs resulting from the reliability analysis of the coded meetings have been used for exploration. All data has been included, leaving no data unexplored. Therefore the results from the thematic analysis have come forth out of an excessive set of sequences.

6.2 Limitations & recommendations

However, like with all research, this thesis is subject to some limitations. Within this research, the data has been gathered from one company even though the data has been gathered from

different departments it decreases the representation of the whole service sector. The reason for that is that it does not consider organisational characteristics that might influence the verbal behaviours being displayed during meetings. Therefore, future research could take into account more organisations operating in the service sector to create a better representation of practical cases in the whole service sector.

Furthermore, since not all participants of the meeting answered the questions in the survey, potential significant opinions have been left out, resulting in the (perceived) meeting effectiveness score being calculated with the data from the people who attended the meeting and who were willing to answer the survey. For research purposes, it would make the data and calculations more reliable if all participants of the meeting answered the survey.

Moreover, the meeting effectiveness scores are merely based on perceptual ratings. To increase the objectivity of the research it be would be suggested to measure or observe the characteristics influencing meeting effectiveness objectively, for example, during meetings and in the same ways verbal behaviours are analysed within the meetings.

Furthermore, research that has been performed solely with the data available on product owners is less reliable due to the small sample size and the unequal distribution within the dependent variable (perceived) meeting effectiveness. Therefore, the results from any statistical test are prone to type 2 errors. Meaning that the null hypothesis is accepted and no meaningful difference in the means is reported. To prevent this from happening in future research a larger sample size should be used.

Lastly, within this research, the duration of the individual behaviours displayed during team meetings has not been taken into consideration. Therefore, it cannot be said how the duration influences the outcomes. In the future, it would be interesting to see whether the duration of the individual behaviours displayed within team meetings support the finding or results in different findings.

7. CONCLUSION

The research question that stands central in this research is: *How do verbal behavioural patterns differ between effective and less effective meetings of agile teams?*

To answer this question, exploratory research in the form of both quantitative and qualitative analysis is performed. First of all, from the statistical tests performed on an individual level it became clear that the verbal behaviours that displayed the most promising difference could be divided into two groups based on the nature of the meeting and the verbal behaviours displayed. The meeting categories planning and refinement form a group and the meeting category retrospective forms a section on its own. This grouping could be made because results showed that verbal behaviours with the most promising differences showed similar results within the planning and refinement meeting but showed opposite results in the retrospective meeting.

The statistical tests performed in relation to the Product Owners dd not stand out because responsibility within agile teams is shared horizontally, in addition, the Product Owner supports the processes within the team.

The patterns around focus behaviours did differ between effective and less effective agile team meetings. The differences are most visible in the data of the various meeting categories and the results concerning the meeting categories. For the first group, planning, and refinement, the focus behaviours around which verbal behavioural patterns are explored showed a difference in the frequency and the repetition of the focus behaviour within patterns surrounding the behaviours *Defending one's own position* for effective team meetings. Within less effective team meetings the patterns are mostly active and passive in nature. *Defending one's own position* falls within the meta-category negative relations but seems to be associated more with meetings perceived as effective. Next to that, the task-oriented behaviour Giving direction/ Long term differed significantly in frequency for effective and less effective meetings. Less effective meetings displayed patterns surrounding this behaviour, however, within effective meetings the behaviour has been displayed too little to explore patterns. Therefore, it can be concluded that behavioural patterns relating to the long-term direction of the team are different for effective and less effective meetings. The assumption that participants of effective team meetings focus more on the current state of affairs can be made.

For the second group, the retrospective meeting, the conclusion can be drawn oppositely. Meaning, that in the retrospective meeting the behaviour *Defending one's own position* was more often displayed by participants of less effective team meetings and for the behaviour *Defending one's own position* the behavioural patterns differed. Next to active and passive patterns also repetition of the focus behaviour is displayed within less effective team meetings. Within effective team meetings, only active and passive patterns are portrayed. Furthermore, the behaviour *Giving direction/ Long term* was more often displayed by participants of effective team meetings and the patterns surrounding the focus behaviour differed from less effective meetings as well. An assumption explaining the opposite results has to do with what the retrospective meeting entails.

8. ACKNOWLEDGEMENTS

I would like to thank my supervisors Lara Carminati, and Desiree van Dun for their honest opinions, feedback, and overall support during the last couple of months. Furthermore, I would like to thank the other students participating in this bachelor circle for their help and collaboration. Lastly, I would like to thank everyone involved that gathered and prepared the data to be analysed.

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10. APPENDIX

10.1 Verbal Behaviours Derived from the Codebook

In this part, the mutually exclusive verbal behaviours derived from the codebook are explained. The codebook contains 23 codes derived from 18 main categories (Wilderom, 2021) and meta-categories derived from Hoogeboom (2021).

Table 5

Codebook on verbal behaviours (Wilderom, 2021)

	Behaviour	**Meta-category**	**Definition**
1	Showing disinterest	Negative relations	Behaviour showing that someone is not attentively focussed on the meeting.
2	Defending one's own position	Negative relations	Behaviour in which a person is defending one's own self-interest or putting someone else at fault.
3a	Giving negative feedback constructive/friendly	Task	Behaviour told in a nice way which leads to a negative experience/evaluation in relation to a person, the team, an action or a project.
3b	Giving negative feedback destructive/hostile	Task	Behaviour told in an unpleasant way which leads to a negative experience/evaluation in relation to a person, the team, an action or a project.
4	Disagreeing	Task	Behaviour through which a person disagrees with one or more team members.
5	Agreeing	Task	Behaviour through which a person agrees or back another or several other team members.
6a	Governing/Correcting	Task	Behaviour through which another team member has to do exactly as they were said, given existing norms or arrangements etc.
6b	Governing/Delegating	Task	Behaviour through which tasks/roles are divided/discussed.
6c	Governing/Interrupting	Negative relations	Behaviour through which a person interrupts another team member.
7	Verifying	Task	Behaviour through which a person checks the state of affairs with regard to certain responsibilities or tasks of one or more team members or where clarification is requested.
8	Shaping the discussion	Task	Any form of behaviour or act through which a person structures or shapes the conversation.
9	Informing with facts	Task	Any behaviour showing a person neutrally announces facts.
10a	Giving direction/Own opinion	Task	Any behaviour through which a goal, directions, own opinions or priorities are discussed.
10b	Giving direction/Long term	Task	Any behaviour through which a team member combines his/her own vision with that of the organization or elaborates the long-term goals of the organization/team.
11	Giving positive feedback	Positive relations	Behaviour through which a person raises the status or feelings of another team member by judging and/or rewarding him/her positively, after the team member has shown positive behaviour or achievements.
12a	Professional challenging/Asking for ideas	Positive relations	Behaviour through which a person asks for the opinions or ideas of a team member or behaviours through which heshe stimulates the team in alternative ways of thinking.
12b	Professional challenging/Stimulating teamwork	Positive relations	Behaviour which contributes to/results in improved cooperation between team members.
13a	Giving positive attention/Being friendly	Positive relations	Behaviour through which a person shows friendly behaviour and/or sympathy to another person.
13b	Giving positive attention/Showing personal interest	Positive relations	Behaviour through which a team members personal interest or empathy is shown towards another team member.
14	Humour	Positive relations	Any form of behaviour through which a person laughs sincerely or makes funny jokes.
15	Sharing personal information	Positive relations	Any behaviour through which a person talks about matter unrelated to work.

16.	Active listening	Listening	Any verbal or nonverbal behaviour which shows that a team member pays attention to what is on the agenda or is comprehending what another team member is saying
17	Focussed task behaviour	Task	Any behaviour which shows that he/she is working autonomously, without directly communicating or interacting with other team members.
18	Rest Category	-	Other category.

10.2 Results Statistical Tests, Individuals

Table 6

Whether the behaviour is more often displayed within effective or less effective team meeting per meeting category

	Behaviour	Planning	Refinement	Retrospective	Combined
1	Showing disinterest	Less effective	Effective	Less effective*	Effective*
2	Defending one's own position	Effective	Effective*	Less effective	Effective
3	Giving negative feedback	Less effective	Effective*	Less effective	Less effective
4	Disagreeing	Less effective	Effective	Effective	Effective
5	Agreeing	Effective	Effective	Less effective	Effective
6a	Governing/Correcting	Less effective*	Effective	Effective	Effective
6b	Governing/Delegating	Effective	Effective	Less effective	Effective
6c	Governing/Interrupting	Effective	Less effective	Less effective	Less effective
7	Verifying	Effective	Effective	Less effective	Effective
8	Shaping the discussion	Less effective	Less effective	Less effective	Less effective
9	Informing with facts	Effective	Effective	Less effective	Effective
10a	Giving direction/Own opinion	Effective	Less effective	Less effective	Less effective
10b	Giving direction/Long term	Less effective	Less effective	Effective	Less effective
11	Giving positive feedback	Effective*	Effective	Less effective*	Effective
12a	Professional challenging/Asking for ideas	Less effective	Less Effective	Effective	Less effective
12b	Professional challenging/Stimulating teamwork	Effective	Less effective	Less effective	Effective
13a	Giving positive attention/Being friendly	Less effective	Less effective*	Less effective	Less effective
13b	Giving positive attention/Showing personal interest	Less effective	Effective	Effective	Effective
14	Humour	Effective	Effective	Less effective	Effective
15	Sharing personal information	Effective	Effective	Effective	Effective
16.	Active listening	Effective	Effective	Less effective	Effective*
17	Focussed task behaviour	Effective	Less effective	Less effective	Less effective
18	Rest Category	Effective	Effective	Effective	Effective

* Difference in mean rank <1,00

Table 7

Results statical tests for each meeting category

	Behaviour	Planning	Refinement	Retrospective	Combined
1	Showing disinterest	0,220	0,072	0,891	0,938
2	Defending one's own position	0,017	0,950	0,355	0,388
3	Giving negative feedback	0,273	0,941	0,436	0,440
4	Disagreeing	0,266	0,169	0,706	0,700
5	Agreeing	0,417	0,127	0,199	0,675
6a	Governing/Correcting	0,982	0,467	0,438	0,475
6b	Governing/Delegating	0,913	0,025	0,164	0,579
6c	Governing/Interrupting	0,006	0,459	0,004	0,851
7	Verifying	0,507	0,185	0,066	0,889
8	Shaping the discussion	0,458	0,158	0,174	0,048
9	Informing with facts	0,672	0,026	0,371	0,385
10a	Giving direction/Own opinion	0,041	0,379	0,001	0,342
10b	Giving direction/Long term	0,017	0,165	0,211	0,271
11	Giving positive feedback	0,990	0,251	0,884	0,496
12a	Professional challenging/Asking for ideas	0,305	0,509	0,408	0,628
12b	Professional challenging/Stimulating teamwork	0,002	0,278	0,173	0,450
13a	Giving positive attention/Being friendly	0,455	0,963	0,297	0,323
13b	Giving positive attention/Showing personal interest	0,690	0.619	0,528	0,617
14	Humour	0,000	0,000	0,183	0,000
15	Sharing personal information	0,741	0,006	0,290	0,019
16.	Active listening	0,180	0,065	0,001	0,996
17	Focussed task behaviour	0,589	0,031	0,101	0,124
18	Rest Category	0,225	0,018	0,773	0,015

10.3 Results Statistical Tests, Product Owners

Table 8

Can normality be assumed?

	Behaviour	Planning	Refinement	Retrospective
1	Showing disinterest	Not assumed	Not assumed	Not assumed
2	Defending one's own position	Not assumed	Assumed	Not assumed
3	Giving negative feedback	Assumed	Not assumed	Assumed
4	Disagreeing	Assumed	Assumed	Assumed
5	Agreeing	Assumed	Assumed	Not assumed
6a	Governing/Correcting	Not assumed	Assumed	Not assumed
6b	Governing/Delegating	Assumed	Assumed	Not assumed
6c	Governing/Interrupting	Assumed	Assumed	Assumed
7	Verifying	Assumed	Assumed	Assumed
8	Shaping the discussion	Assumed	Assumed	Not assumed
9	Informing with facts	Assumed	Assumed	Assumed
10a	Giving direction/Own opinion	Assumed	Assumed	Assumed
10b	Giving direction/Long term	Not assumed	Assumed	Assumed
11	Giving positive feedback	Not assumed	Assumed	Not assumed
12a	Professional challenging/Asking for ideas	Assumed	Assumed	Not assumed
12b	Professional challenging/Stimulating teamwork	Assumed	Assumed	Not assumed
13a	Giving positive attention/Being friendly	Not assumed	Not assumed	Not assumed
13b	Giving positive attention/Showing personal interest	Not assumed	Not assumed	Not assumed
14	Humour	Not assumed	Assumed	Assumed
15	Sharing personal information	Not assumed	Assumed	Not assumed
16.	Active listening	Not assumed	Assumed	Assumed
17	Focussed task behaviour	Not assumed	Assumed	Assumed
18	Rest Category	Assumed	Not assumed	Assumed

Table 9

Results from the statistical tests performed in relation to the Product Owners per meeting category

	Behaviour	Planning	Refinement	Retrospective
1	Showing disinterest	0,343	1,000	0,571
2	Defending one's own position	0,886	0,656	0,786
3	Giving negative feedback	0,210	1,000	0,375
4	Disagreeing	0,462	0,446	0,228
5	Agreeing	0,137	0,917	0,360
6a	Governing/Correcting	0,114	0,986	0,393
6b	Governing/Delegating	0,945	0,695	0,786
6c	Governing/Interrupting	0,580	0,545	1,000
7	Verifying	0,492	0,266	0,121
8	Shaping the discussion	0,825	0,599	0,393
9	Informing with facts	0,120	0,789	0,112
10a	Giving direction/Own opinion	0,286	0,394	0,228
10b	Giving direction/Long term	0,686	0,598	0,786
11	Giving positive feedback	0,577	0,472	0,143
12a	Professional challenging/Asking for ideas	0,180	0,542	0,393
12b	Professional challenging/Stimulating teamwork	0,001	0,502	1,000
13a	Giving positive attention/Being friendly	0,860	1,000	0,393
13b	Giving positive attention/Showing personal interest	0,886	1,000	1,000
14	Humour	0,114	0,736	0,779
15	Sharing personal information	0,486	-	0,393
16.	Active listening	0,200	0,314	0,079
17	Focussed task behaviour	0,886	0,441	0,863
18	Rest Category	0,445	1,000	0,461