COUNTERPRODUCTIVE & SUPPORTING BEHAVIOURS: AN EXPLORATORY STUDY OF BEHAVIOURAL DIFFERENCES WITHIN SCRUM TEAM MEETINGS

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ABSTRACT,
With increasing adoption of the agile and Scrum methodologies, the demand for meetings within the work setting is steadily rising. This research focuses on the different manifestations of supporting (positive) and counterproductive (negative) meeting behaviours within Scrum team meetings and their effects on meeting effectiveness. Thematic and frequency analysis are used to explore preceding and succeeding behaviours which were observed via videotaped meetings. The data consists of 8 teams over the course of one sprint. The results show a pattern of self-perpetuating positive and negative behaviours during a meeting. Additionally, effective team meetings display lower levels of negative meeting behaviour and react to negative feedback with communication strategies that are focused on solutions rather than counterproductive behaviours compared to their ineffective counterparts. Here these themes are discussed and patterns and recommendations for future research are given.

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1. INTRODUCTION

At the beginning of the 2010s, a large financial organisation in the Netherlands was confronted with changing customer behaviour and the emergence of new digital distribution channels. In response to these changes, they decided to "*stop thinking traditionally about product marketing and start understanding customer journeys in this new omnichannel environment"* (Jacobs, Schlatmann, & Mahadevan, 2017, p. 2). The demand for flexibility and ability to adapt to rapidly changing environments required an organisational shift. As one of the forerunners within this field, this financial institution has transformed their whole organisational structure into an adaptable working environment that balances both flexibility and stability. This is known as an agile working environment.

Originating in the software industry, the introduction of agile working methods has expanded beyond its native compounds in recent years to influence other sectors under the name of agile project management. The adoption of an agile project management leads to rapid changes within organisations' teams and structures (Rigby, Sutherland, & Takeuchi, 2016). The pillars of the agile methodology are self-managing and cross-functional teams, absence of formal leadership within teams, as well as high levels of interdependence and coordination among team members (Cockburn & Highsmith, 2001).

Given the importance of team members' relationships, autonomy and development in agile working environments, optimal communication and smooth interactions between those team members (or "Scrum participants" in new agile terminology - see the section Theoretical Framework for details) are crucial. In fact, the quality of members' communication and interaction may be reflected in individuals' positive or negative behaviours during meetings and thus become indicative of meeting effectiveness (Akif & Majeed, 2012; Cho, 2008). Previous research has indeed linked meeting effectiveness to these behaviours (Kauffeld & Lehmann-Willenbrock, 2012).

Within team meetings, behaviours are defined as all actions displayed by the members during the course of it (Van Dun, Hicks, & Wilderom, 2017). Behaviours manifest in different types: behaviours that are more task oriented; positive behaviours –that are relation-, change- or task- oriented (e.g. agreeing and asking for idea); and negative behaviours –that revolve around criticising others and/or defending one's own position in the light of further questioning.

This interest in people's behaviour results from an increased focus on people themselves within the scope of adopting agile software development methods. In their research, Cockburn and Highsmith (2001) have underlined the crucial relevance of self-organisation, team communication, mutual trust and development of competencies of individual people in order to achieve meeting effectiveness. They showed that collaboration, defined as "*actively working together to deliver a work product or make a decision*" (Cockburn & Highsmith, 2001, p. 2) is the key element for teams to be able to deal with ambiguity and fast decision making. Similarly, Olson, Olson, Carter, and Storrosten (1992) found that coordination and teamwork is essential within software development to reach meeting effectiveness.

2. RESEARCH GAP

While there have been previous findings of the importance of communication within meetings and how they can affect the wellbeing and happiness of software developers (Schneider et al., 2018) and how behaviours can influence meeting effectiveness (Kauffeld & Lehmann-Willenbrock, 2012), little research has been conducted on how positive or negative meeting behaviours manifest within regular Scrum. Additionally, a comparison of meeting behaviour in different Scrum ceremonies (i.e. "meetings" in agile new terminology, detailed later on in the Theoretical Framework) has not been done previously. This paper tries to bridge this gap by investigating counterproductive and productive meeting behaviours within regular Scrum and develop an understanding of how regular Scrum ceremonies differ from each other in this regard. These aspects motivate the research question: *How do counterproductive and supporting behaviours manifest in regular Scrum meetings?*

With the more specific sub-questions of:

RQ1. Which behaviours can be observed in effective and non-effective meetings?

RQ2. How does behaviour diverge between different regular Scrum meetings?

There has been extensive research into the topic of agile software development, but much less has been done in the field of agile working methods like regular Scrum and their relation to meeting effectiveness, as well as team behaviours and effectiveness (Moe & Dingsøyr, 2008). The paper presented here aims to extend the field and contribute to the literature on agile working in two ways. Firstly, by providing new findings on how self-orienting behaviours or supporting behaviours can influence regular Scrum meetings and how they relate to meeting effectiveness. Secondly, by showing potential differences between the three Scrum events of planning, review, and retrospective considering supporting and self-oriented behaviours. Indeed, currently there are no academic papers investigating either potential differences of regular Scrum events in terms of meeting effectiveness in general or which behaviours characterise the different meeting types. This paper will aim to reduce this gap.

By investigating the aforementioned research questions, this thesis also aims to contribute to business practice. The observation of agile work teams throughout a sprint allows a better understanding of the behaviours displayed during work meetings and instances where a team engages is engaging in self-oriented or supporting behaviours. As this paper will show, different of scrum meetings should be treated differently as displayed behaviours are unique to Scrum events. Furthermore, effective teams may follow display behaviours when dealing with negative feedback than ineffective teams. Therefore, practitioners can help teams improve meeting effectiveness by focusing on their behaviours. This thesis tries to identify patterns of such behaviours in the scope of scrum framework and identify the differences between different scrum events.

The structure of this thesis is as follows; First a general literature review of meeting and meeting effectiveness, shared leadership and meeting behaviours is provided. Following this,

the frequency and thematic analysis is described, and their results are discussed. Lastly, limitations and recommendations for future research are given.

3. THEORETICAL FRAMEWORK

In this section, relevant literature is discussed. This entails a review of literature focusing on scrum, software development, agile methods, meeting behaviours.

3.1 Agile, Scrum and the Importance of Collaboration

Jeff Sutherland and Ken Schwaber (1997) introduced the idea of agile methods for software development. During the analysis of common software development processes "*they found that traditional development approaches were not suitable for empirical, unpredictable and non-repeatable processes"* (Cervone, 2011, p. 2).

Even though there are several approaches whereby agile methods within organisations can be implemented, four key principles constitute the underpinning rationale illustrated in the "Manifesto for Agile Software Development" (Fowler & Highsmith, 2001) namely:

1. Individuals and interactions over processes and tools.
2. Working software over comprehensive documentation.
3. Customer collaboration over contract negotiation.
4. Responding to change over following a plan.

There are several ways of how to best apply these principles and therefore the agile method: Scrum, extreme project management, adaptive project management, and dynamic project management. The most used of these is the Scrum Team model (Cervone, 2011).

The Scrum Team model is comprised of Product Owner, the Development Team, and a Scrum Master. Whilst the Product Owner is responsible for managing the product backlog (i.e. features that still need to be implemented) for maximising the value of the product with the work of the Development Team, the Development Team is a self-organising and cross-functional team (Sutherland & Schwaber, 2013). The Scrum Master is the role traditionally assumed by a project manager but acts as a servant leader to the Development Team to better understand the Scrum methodology. Graham (1991) identified the main servant leadership characteristics as humility, emulation of leader's service orientation, relational power, autonomy, and moral development of followers. The Scrum event has four ceremonies (meetings) overall: sprint planning meeting, daily Scrum, the sprint review meeting and the sprint retrospective (Sutherland & Schwaber, 2013).

Within regular Scrum, the self-organising and cross-functional Development Team usually consists of five to ten people working full time on the project. The leadership role within the team is not fixed and changes depending on the needs at any given time. Collaboration and teamwork within regular Scrum are facilitated through the Scrum ceremonies (Cockburn & Highsmith, 2001).

Within the sprint planning, the workload, goals and the approach to achieving these goals for the next sprint, which is typically defined as two weeks, are decided among the Scrum team (Sutherland & Schwaber, 2013).

The daily Scrum is a short meeting of the Development Team during a sprint that serves to inspect the progress towards the sprint goals (Sutherland & Schwaber, 2013). Moreover the Daily Scrum improves performance and supports quick decision making for the Development Team (Sutherland & Schwaber, 2013). The sprint review is held at the end of a sprint. This event is used to present work completed during the sprint, to gather feedback on the process of the sprint and is meant to increase collaboration between the Scrum team and the stakeholders (Sutherland & Schwaber, 2013).

The Scrum retrospective occurs after the review and allows the Development Team to inspect the team process and tools used during the last sprint, to gather feedback and develop improvements for the next sprint. The goal of the overall improvement is to make upcoming sprints more enjoyable and effective for the Scrum team and therefore be able to provide more value (Sutherland & Schwaber, 2013).

Most tasks within agile working methods are exclusively done within teams and in the setting of regular Scrum ceremonies. These ceremonies are meetings that frame the work done by software developers and cement the prevalence of multiple meetings for the team during the workweek.

3.2 Meetings and Meeting Effectiveness

As one of the key aspects of modern business practises and one of the cornerstones of agile working methods, meetings are commonplaces within the agile methods and especially within Scrum. Meetings are defined as "*purposeful work-related interactions occurring between at least two individuals that have more structure than a simple chat, but less than a lecture*" (Rogelberg, Allen, Shanock, Scott, & Shuffler, 2010, p. 2). On average, employees spend more than six hours per week in meetings (Rogelberg, Leach, Warr, & Burnfield, 2006). Team members use meetings to exchange information, solve problems or deal with decision making (Leach, Rogelberg, Warr, & Burnfield, 2009) and they interact with each other through teamwork (Schwartzman, 1989). Taking up a large amount of a worker's time and driving forward the decision making and problem-solving process, the effectiveness of meetings can impact the employees and the organisation as a whole.

For a meeting to be effective, it must not only be worth the time spent, but also be considered productive and efficient in terms of use of time (Rogelberg et al., 2006). Moreover, it must be noted that the perception of the overall effectiveness of a meeting is rather subjective, since each team member can evaluate the time spent within the meeting in different ways and this can influence their behaviour within meetings (Bennett, 1998; Leach et al., 2009). Perceived meeting effectiveness thus refers to the degree to which the goals of a workplace meeting are fulfilled in terms of individual, group and organisational goals (Leach et al., 2009). Similarly, meeting effectiveness can be described as the individual's satisfaction with the meeting itself (Hinkin & Tracey, 2003).

Leach et al. (2009) have identified principles that can have a positive effect on meeting effectiveness: keeping minutes, punctuality, appropriate meeting facilities and having a chairperson/leader. Along a similar line, proposals on how to improve team meeting trainings included learning goals, planning and disseminating meeting agendas, critical decision making, constructive conflict resolution, encouraging participation, managing cultural differences and active listening (Rogelberg et al., 2010). However, previous research has also found that team members within software development did not always engage in active listening when others were talking in the daily meeting and were not paying full attention when the focus of the meeting was not directly on development (Moe & Dingsøyr, 2008). Hence, these behaviours can in general hinder meeting effectiveness.

Within regular Scrum, previous studies identified communication and Scrum ceremonies as two main issues influencing the effectiveness of meetings within Scrum implementations (Akif & Majeed, 2012; Cho, 2008). The increased need for constant communication forces an escalation in the number of meetings and leads to a loss of interest of team members, who must attend all meetings even if they are not directly relevant to their work (Akif & Majeed, 2012; Cho, 2008). Therefore, if communication and collaboration are mainly accomplished within workplace meetings, the effectiveness of meetings is of pivotal importance not just to the meeting attendants themselves, but also for the overall success of the organisation. Since meeting effectiveness has been linked to the relationships across team members, as well as behaviour displayed by the attendants during the meeting (Allen, Lehmann-Willenbrock, & Belyeu, 2016), the following two sections tackle team members' shared leadership as well as their positive and negative behaviours in relation to meeting effectiveness.

3.3 Shared Leadership

For Scrum teams to fulfil their tasks, they are given a high amount of authority on multiple aspects of their work (Moe, Dingsyr, & Kvangardsnes, 2009). They are responsible for how they divide their work streams and which parts are worked on in each sprint. This connects back to the fact that meetings are an integral part of responsibility and authority given to the teams and that team members' participation and involvement has been found to be increased in teams that are self-organising and autonomous (Scott-Young, Georgy, & Grisinger, 2019). In these self-organising teams, the role of leadership is divided among all team members (i.e. the Product Owner, Scrum Master, and the development team). To understand how this should be implemented, it is essential to understand the concept of shared leadership.

The principle of shared leadership is that leadership is distributed across team members rather than being concentrated in a single person and role and that team leadership functions are voluntarily shared among internal team members in pursuit of team goals (Kozlowski, Mak, & Chao, 2016; Nicolaides et al., 2014). Pearce (2004, p. 1) describes shared leadership as a "*dynamic, interactive influence process among individuals ingroups for which the objective is to lead one another to the achievement of group or organisational goals or both. This influence process often involves peer, or lateral, influence and at other times involves upward or downward hierarchical influence*".

Besides being a multi-lateral influencing process, shared leadership is also based on the idea that leadership is not the characteristic of a single person, but rather a role enacted in behaviours (Lord, Day, Zaccaro, Avolio, & Eagly, 2017; Scott-Young et al., 2019). Hence, within meetings of Scrum development teams, each member can be considered a (shared) leader who acts as part of the self-organising team and shows specific behaviours during a Scrum development event or meeting. These behaviours can be broadly classified as positive and negative, depending on how they affect meeting effectiveness.

3.4 Effect of Positive and Negative Meeting Behaviours

In general terms, behaviours can be described as "*specific actions, which occur in a particular setting at a particular time*" (Smith & Bond, 1999, p. 65), while, within lean-leadership research and team meeting settings, the behaviour of an individual can be defined as "*specific observable verbal and nonverbal actions of managers in interaction with their followers in an organizational setting*" (Van Dun, Hicks, & Wilderom, 2017, p. 2). Even though there is no direct leader-follower relationship in agile teams due to the shared-leadership approach previously described, the definition of verbal behaviour in lean is adopted, given the focus of this thesis on behaviours in meetings within the workplace and the adoption of a coding scheme based on the work of lean-leadership research.

Implementing the lean definition of behaviour also allows for the application of the behavioural taxonomies that were used in the research and codebook on effective lean team leaders by Hoogeboom and Wilderom (2015). This codebook is mostly based on two main works. The first one is Yukl et al. (2002), according to which the (positive) behaviours that were displayed by effective managers within meetings were related to three behavioural domains, namely human relations, change and task efficiency. These include active listening, agreeing, providing positive feedback, and asking for ideas. The second work is Van der Weide's (2007) classification, in which five counterproductive behaviours were added to Yukl et al.'s (2002) positive ones. The counterproductive behaviour codes describe showing disinterest, disagreeing, providing negative feedback, and defending one´s own position. These are also similar to the functional (positive) and dysfunctional (negative) behaviours recorded by Kauffeld & Lehmann-Willenbrock (2012). In their research, positive (socioemotional) statements include active listening, giving feedback, and providing support, whereas socioemotional (negative) statements include criticising, self-promotion and showing disinterest. Of particular interest for this thesis is the effects of meeting citizenship (positive/supporting) behaviours and counterproductive (negative) meeting behaviours as they can influence the overall effectiveness of the meeting.

Meeting citizenship behaviours have been linked to an increase in meeting satisfaction and effectiveness, leading to higher employee engagement and less emotional exhaustion (Kauffeld & Lehmann-Willenbrock, 2012; Lehmann-Willenbrock & Allen, 2014). More recently, Schneider et al. (2018) found that

positive meeting behaviours can also have a positive effect on the wellbeing of team members if proactive statements are followed by a supporting statement. Within their study of 32 student teams, they found that a positive group affective tone is triggered by proactive statements via supportive statements and that supportive statements are triggered by proactive statements.

On the contrary, the effects of counterproductive meeting behaviours have been investigated by Allen et al. (2016) who showed that counterproductive meeting behaviours had a negative effect on both meeting satisfaction and effectiveness which, in turn, led to an increase in emotional exhaustion. Additionally, dysfunctional meeting behaviours as well as behaviour patterns have been connected to decreased meeting satisfaction and more distal performance outcomes (Kauffeld & Lehmann-Willenbrock, 2012; Lehmann-Willenbrock & Allen, 2014). Indeed, negative meeting behaviours can manifest as critiques to others or complains and disagreement (Kauffeld & Lehmann-Willenbrock, 2012). This manifestation becomes problematic within a meeting if such negative behaviours develop into a recurring pattern that lead to a cycle of counterproductive meeting behaviour. This would lead to a decrease in the effectiveness of the meeting and of overall team performance. For example, if a participant starts complaining, this complaint will likely receive support from others, which will in turn generate more complaining (Kauffeld & Meyers, 2009; Lehmann-Willenbrock & Kauffeld, 2010; Schneider et al., 2018). Since participants are usually not aware of any patterns of behaviour occurring, either positive or negative, they are likely to be led into recurring cycles (Schneider et al., 2018).

Whilst within the software development research this type of behavioural coding has been already used, albeit only recently, its implementation has been neglected in the context of regular Scrum meetings (Schneider et al., 2018). Given the importance of assessing positive or negative behaviours in meetings to assess their effectiveness, and the prevalence of meetings in Scrum compared to a regular hierarchical workplace, the coding of supporting and counterproductive behaviours (agreeing, providing positive feedback, asking for ideas and showing disinterest, disagreeing, providing negative feedback, defending one´s own position, respectively) in the context of regular Scrum represents the core of this thesis, as Scrum requires many meetings within their methodology even more prevalent than within regular hierarchical workplace meetings. Nonetheless the overall demand for meetings is high in all workplace settings (Rogelberg et al., 2006).

4. METHODOLOGY

4.1 Research Design

The data necessary to conduct this research was collected within a large Dutch finance organisation practising agile project management. It covers 8 teams with a total of 71 respondents who are recorded and measured throughout one development sprint. Each sprint contains three meetings with sprint planning, sprint review, and sprint retrospective.

The data collection concerning the meeting behaviours was done via coding videotapes of secondary data gathered at this large Dutch financial institution. The data on the meeting effectiveness was collected via a survey answered by the meeting attendees. Meeting effectiveness was assessed with a 4-item, 7-point Likert scale, adapted from Rogelberg, Leach, Warr, and Burnfield (2006) and Nixon and Littlepage (1992) anchored at 1 = *strongly disagree* and 7 = *strongly agree* for: The questions are: if this meeting was “effective”, “worth my time”, “productive” or “efficient” .

The data on meeting behaviour was gathered by coding the meetings through a coding scheme developed by Hoogeboom and Wilderom (2015) in the department of Change Management & Organisational Behavioural (CMOB) at the University of Twente. This is based on one of the behavioural domains developed by Yukl, Gordon, and Taber (2002) and Van der Weide (2007). Table 1 represents a list of the positive and negative behaviours chosen for analysis in this thesis. The counterproductive behaviours are: showing disinterest, disagreeing, providing negative feedback, and defending one´s own position as they are previously developed by Van der Weide (2007). They were also integrated into the work by Hoogeboom and Wilderom (2015) under the name self-oriented behaviours within the coding scheme developed by CMOB. Additionally these are similar to the negative statements found in the meeting behaviour research by Kauffeld and Lehmann-Willenbrock (2012). Together with the above list of counterproductive behaviours, a selection of positive/supporting behaviours has been made. These are found within the change- and relation-oriented behaviours developed and described in the coding scheme of Hoogeboom and Wilderom (2015). These behaviours are: active listening, agreeing, providing positive feedback, and asking for ideas. Since these positive behaviours identified by Hoogeboom and Wilderom (2015) overlap with the ones described in the act4teams coding done by Kauffeld and Lehmann-Willenbrock (2012), they have been chosen as representative of supporting behaviours in this thesis.

Table 1: Positive & negative behaviours

Positive (Supporting) behaviours *(Hoogeboom & Wilderom, 2015; Yukl, Gordon, & Taber, 2002)*	**Negative (Counterproductive) behaviours** *(Van der Weide, 2007)*
Agreeing	Disagreeing
Giving positive feedback	Giving negative feedback
Asking for ideas	Defending own position
(Actively listening)	Showing disinterest

Importantly the behaviour of “actively listening” will be excluded from this analysis, as it was coded as the neutral behaviour within the observed meetings making it not a relevant positive behaviour as previous research would suggest.

4.2 Analysis

To gain insights on how supporting and counterproductive behaviours manifest within regular Scrum Thematic Analysis, as described by Braun and Clarke (2006), as well as frequencies of behaviours will be used to identify behaviour differences within the regular Scrum meetings. Thematic Analysis *“is a method for identifying, analysing and reporting patterns*

(themes) within data" (Braun & Clarke, 2006, p. 79). It allows freedom to explore the data while at the same time providing an account of the data that is both rich and detailed while being complex and flexible at the same time (Braun & Clarke, 2006).

A deductive top down approach is chosen to find patterns within the data. It entails the use of existing literature and themes to guide the exploration of the data. This allows for the initial inclusion of existing literature to guide the coding based on a specific research question and is more analytically driven. The downside of this is that Thematic Analysis provides a less rich description of the overall data (Braun & Clarke, 2006, p. 84) as the analysis of the data is already guided by the research question and could prevent discovery of patterns within the data. For this research, the guided approach allows for a narrowed view on the patterns that emerge around the occurrence of positive or negative behaviours. The coding is driven by the constructs of the research question on counterproductive and supporting behaviours.

To implement Thematic Analysis a 6-phase guide has been suggested by Braun & Clarke (2006). Phase 1: Familiarising yourself with your data and Phase 2: Generating initial codes built on transcribing the data and noting down initial ideas. Moreover, the coding of interesting features in a systematic fashion (Braun & Clarke, 2006). Instead of generating new codes, the codes provided by the Codebook by CMOB are used to initially identify moments of counterproductive and supporting behaviours within the data. Phase 3 entails the collection of codes into potential themes and gathering of all data relating to these. The analysis of potential pattern within the coded data is done based on the three preceding and succeeding behaviours around the selected counterproductive or supporting behaviour. The trigger behaviour itself was not counted within this pattern. This more parsimonious selection of preceding and succeeding behaviours was opted for after an initial investigation of five preceding behaviours yielded similar results. This results in set of themes which display the initial results and later gets developed in Phase 4 through refinement of the initial themes into a developed theme map. This phase involves reviewing the coded data as well as the relation towards the whole data set. The patterns or themes that can be found are based on the occurring behaviours around the positive and negative behaviour codes. Using summary tables that describe the relative frequency of all selected preceding and succeeding behaviours, which include the behaviours that occurred before and after each coded positive or negative behaviour, allows identification of what happened within the meeting when positive or negative behaviours emerged. Phase 5 culminates in naming and defining the found themes. Lastly, Phase 6 is the explanation of the findings in a scholarly report enriched by examples (Braun & Clarke, 2006), which will be discussed in the results section.

4.3 Sampling Procedure and Sample Description

The meetings were coded by two independent coders for each meeting with the Noldus Observer software package Version 15 (Noldus, Trienes, Hendriksen, Jansen, & Jansen, 2000) and based on the codebook by CMOB. These files were combined into a golden file (i.e. a combined file based on the independent coding of two different coders) to minimise bias of one coder. All behavioural codes were mutually exclusive, which means that no two behaviours could be coded at the same time.

The sample consists of regular Scrum teams that have been together for at least 3 months and include software developers, Scrum Master and Product Owner. The sample consists of 71 team members with an average age of 39. The teams are 76% male and 24% percent female. 28% are educated to the level of a bachelor's degree, 70% obtained a master's degree or higher, and 2% with lower than bachelor's degree of education. The team size was between 5 and 9 members. The sample consists of only 16 teams, as not all coding activities were concluded by the time of this thesis.

The perceived meeting effectiveness was collected for all meetings, such that more and less effective meetings can be selected and separated. The average meeting effectiveness for Planning is 5.57 (*Median*=6.0, *SD*=1.11) for Review 5.48 (*Median*=6, *SD*=1.15) and for the Retrospective 5.44 (*Median*=5.75, *SD*=0.96). Based on this, three highly effective meetings (*Median*>6.00) and four ineffective meetings (*Median*< 5.00) can be selected. The median was chosen over the *Mean* as it is more robust to outliers.

4.4 Measures

As mentioned, the codes to detect the occurrence of positive or negative meeting behaviour within the second phase of the Thematic Analysis are based on the coding scheme with 18 unique behaviours developed by the department of CMOB at the University of Twente. The codes relating to positive and negative meeting behaviours can be found in the Appendix I. For this thesis, the frequencies of all coded behaviours and the patterns that occur when either a positive or negative behaviour is found within a meeting are of key interest.

5. FINDINGS

5.1 Behaviour Frequencies

Using the coded behaviours of all meetings the frequency of all behaviours can be summarised (see Table 2).

Firstly, by showing the total number of recorded behaviours over all meetings and their frequency distribution a general understanding of the distribution of behaviours can be gained. Out of all 15,778 coded behaviours the most common one was "Actively listening" making up 42.9% of all coded behaviours as this was used as the standard neutral behaviour during the coding process, followed by "Informing with facts" and "Providing own opinion" making up 23.9% of all coded behaviours.

Out of all coded positive behaviours "Agreeing" is the most common one making up 4.7% of all behaviours with all positive behaviours together making up 6.0% of all coded behaviours. Most common within the negative behaviours is "Showing disinterest" with 2.2% of all behaviours. All negative behaviours combined make up 4.4% of all coded behaviours.

All 16 meetings can be divided up into their various Scrum events: Planning, Review and Retrospective. There was a total of 7,554 coded behaviours for Planning, a total of 4,927 behaviours for Review and a total of 3,297 behaviours for Retrospective.

Table 2: Frequencies of observed behaviours

Behaviours	*Relative frequency of observed behaviours in %*					
	Total	**Scrum events**			**Ineffective meetings**	**Effective meetings**
		Planning	Review	Retrospective		
Positive behaviours						
Agreeing	4.70	4.24	5.28	4.88	3.88	4.75
Giving positive feedback	0.87	0.66	0.32	**2.15**	0.52	0.70
Asking for ideas	0.45	0.48	0.45	0.39	0.98	0.31
Actively listening	42.91	42.73	43.56	42.34	42.58	42.31
Negative behaviours						
Disagreeing	0.91	0.75	1.20	0.85	1.77	0.34
Giving negative feedback	0.56	0.21	0.28	**1.76**	0.61	0.08
Defending own position	0.74	0.57	0.89	0.88	0.09	0.68
Showing disinterest	2.21	3.43	0.67	1.70	5.09	2.05
Other behaviours						
Informing with facts	12.87	13.45	14.21	9.55	8.86	12.46
Giving own opinion	11.02	10.26	11.33	12.31	15.08	10.38
Verifying	7.95	8.71	8.12	5.94	7.96	7.59
Governing/Correcting	0.25	0.16	0.43	0.18	0.23	0.11
Governing/Delegating	0.30	0.46	0.18	0.09	0.38	0.34
Governing/Interrupting	4.15	4.21	4.93	2.85	5.21	5.40
Shaping the discussion	2.21	1.99	2.13	2.82	1.71	1.91
Giving direction/Long term	0.03	0.03	0.00	0.06	0.00	0.00
Professional challenging/Stimulating teamwork	0.86	1.16	0.49	0.73	0.35	1.74
Humour	3.69	2.91	3.75	5.37	0.72	4.05
Giving positive attention/Being friendly	0.22	0.26	0.14	0.21	0.14	0.28
Giving positive attention/Showing personal interest	0.27	0.12	0.26	0.64	0.17	0.08
Focussed task behaviour	0.96	1.39	0.12	1.21	0.61	2.76
Null behaviour	1.62	1.62	1.06	2.46	2.72	1.58
Total recorded behaviours in absolutes	15,778	7,554	4,927	3,297	3,455	3,555
Sum of all negative behaviour	4.41	4.96	3.04	5.19	**7.55**	**3.15**
Sum of all positive behaviour	6.01	5.37	6.05	7.43	5.38	5.77

Looking at different Scrum meetings, "Actively listening" occurred at similar frequencies (42.3-43.6%), with "Informing with facts" being less common (9.5%) in the Retrospective and "Giving own opinion" being more common (12.3%) compared to the other meetings. The most common positive behaviour was still "Agreeing" with all positive behaviours making up between 5.3 and 7.4% of all coded behaviours. Additionally, positive feedback is more common in the Retrospective meetings, making up 2.2%. Negative behaviours occurred between 3.0% and 5.2% within the different Scrum events, being least common in the Review. While "Showing disinterest" is still the most common negative behaviour in the Planning meeting, the most coded negative behaviour in the Review is "Disagreeing" and "Giving negative feedback" in the Retrospective.

Looking at the effective compared to ineffective team meetings, it can be seen that both have a similar number of

positive behaviours, making up 5.4-5.8% of all behaviours. However, for negative behaviours there is a larger difference between the two types of meetings. Within highly effective meetings, negative behaviours only make up 3.1% of all coded behaviours compared to 7.6% within ineffective teams. Within effective teams both "Disagreeing", "Showing Disinterest" and "Negative feedback" behaviours happen at a much lower rate. While "Humour" and "Defending own position" behaviours are a lot more common in effective meetings, making up 4.1% of all behaviours within effective meetings.

5.2 Thematic Analysis

Using the coded behaviours for all meetings, Thematic Analysis, and the frequency of behaviours before and after a given trigger behaviour was used to find and determine patterns that emerge from the coded data. The three key patterns are described below. See Appendix II Table 3 for the frequency table.

5.2.1 Theme 1: Repetition of Behaviour

Looking at the patterns that emerge from behaviours right before or after the occurrence of positive or negative behaviours, a dynamic of repetitions of the same behaviour can be observed. The most common observed behaviour out of all either positive or negative behaviours around (i.e. not differentiated between before and after) one of the triggered positive or negative behaviours is the same behaviour again. Looking at all coded meetings, for example, "Showing disinterest" occurred close to itself again in 14% of all cases compared to the other negative or positive behaviours in which "Showing disinterest" behaviour was seen less than 4% of the time. Moreover, this pattern of repetition of the behaviour itself can be seen for all other trigger negative behaviours: "Defending own position" in 2.0%, "Giving negative feedback" 3.3% and "Disagreeing" 3.6% behaviour, as well as appearing for the positive behaviours of "Giving positive feedback" 5.0% and "Agreeing" 6.2% . Only "Asking for ideas" seems not in line with this pattern with the most common behaviour around it being "Disagreeing". When separating the data into only behaviours that happened before the occurrence of a positive or negative behaviour this pattern can still be observed. When separated into behaviours that happen only after a trigger behaviour was observed, the pattern holds for all cases except "Agreeing" that occurs in 7.7% after giving negative feedback comparted to other positive or negative behaviours.

5.2.2 Theme 2: "Facts & Opinions" around Positive Feedback

The second pattern that could be observed is based around the different occurrence of the behaviours "Informing with facts" and "Giving own opinion" around all three positive meeting behaviours. When the positive behaviour of "Giving positive feedback" was coded, the behaviour of "Informing with facts" appeared more often (12.0% compared to 9.0% and 7.4%) than the other two positive behaviours. Mirroring this, the behaviour "Giving own opinion" occurred less (9.1% compared to 14.6% and 16.3%) around positive feedback giving behaviour. In contrast the other two positive behaviours were weighted more towards being around opinion giving behaviour. When looking at the separated data for behaviours that occurred before or after the trigger positive behaviour this pattern still holds. This can be seen in the Appendix Table 3 to Table 5.

5.2.3 Theme 3: Noteworthy Extras: Reacting to Negative Feedback

Another pattern can be observed when looking at the dataset separated into highly effective and non-effective meetings based on the median, as described in the methodology section. When comparing the behaviours that can be seen around the negative behaviour of "Giving negative feedback", the two differ in multiple ways. In highly effective meetings the behaviours that are most common around" Giving negative feedback" are "Agreement", "Challenging each other professionally" and "Giving positive feedback". This is in stark contrast to the ineffective meetings in which "Showing disinterest" and "Verifying" behaviour were more common. Additionally, ineffective meetings were characterised by an increased number of disinterested behaviours around any positive or negative behaviour compared to highly effective meetings. In the latter, this happened only around the negative behaviour of "Showing disinterest", as discussed in the *Theme 1*.

6. DISCUSSION

This thesis set out to address the research questions of how positive or negative behaviours manifest within Scrum meetings and how they further differ between effective and ineffective meetings (RQ1) and the Scrum events (RQ2)

6.1 Contagious Positive and Negative Behaviours

As answer to the first research question, the identified *Theme 1* of this thesis suggests that within meetings, after a positive or negative behaviour has been displayed by one of the team members, there is a pattern of repetition of similar behaviours, where "Defending own behaviour" occurs around itself 2.0% of the time and 14.0% for "Showing disinterest". This means that it is more likely to get the same reaction of behaviour out of all the other possible alternative positive or negative behaviours. Examples of this were the occurrence of" Giving positive feedback" behaviour when another team member already had provided positive feedback being 5.0% of all behaviours observed. Previous research by Kauffeld and Meyers (2009) suggested that there are circles of supporting or complaining statements which can either boost or hinder the effectiveness of team meetings. This thesis used all recorded behaviours within a meeting without differentiating between the different team members. Thus, while it is possible that the same team member displayed the same behaviour multiple times right after each other, it was more common that after one team member engaged in a positive or negative behaviour another team member would do the same.

A possible explanation for how this happens can be traced back to the phenomenon of emotional contagion. Previous research by Barsade (2002) has found that emotional contagion, a process whereby a person can influence the emotions of other group members through their own positive or negative emotions, can be a significant process through which group members' positive and negative behaviours could influence others' behaviours. Indeed, contagion could explain why the

same behaviours, regardless of their supporting or counterproductive nature, seem to repeat themselves more often than comparable other positive or negative behaviours leading to patterns of reoccurring cycles (Barsade, 2002; Lehmann-Willenbrock & Kauffeld, 2010).

Theme 2 addresses the first research question (i.e. how positive or negative behaviours manifest within Scrum meetings) by suggesting a difference within the positive behaviours in relation to task-focused behaviours of "Informing with facts" and "Giving their own opinion". " Giving positive feedback" was more likely to occur around "Informing with facts". This indicates that the positive behaviours used in this thesis could be separated into two different categories. First, grouping "Asking for ideas" and "Agreeing", and, secondly, "Giving positive feedback". This can be linked back to the research done by Ashford (1986) as feedback is sought when individuals are confronted with important decisions and issues they are unsure about. This would be more common if a team member informs their peers factual about their work (i.e. informing with facts) looking for feedback about their work, than if they provide their own opinion to their peers.

6.2 Meeting Effectiveness Matters

As further elaboration on the first research question, focusing on the difference between how positive or negative meeting behaviours manifest within effective and ineffective meetings, there was a clear divergence in negative behaviours when looking at teams that rate their meeting effectiveness as especially high or low on average. Negative behaviours were a lot more common within ineffective meetings, perhaps due to the increase in disinterest shown by their participants and the higher number of disagreements and negative feedback the team members received. Indeed, counterproductive behaviours have previously been linked to a decrease in meeting effectiveness and the pattern that is found within scum teams suggests a similar relationship (Kauffeld & Lehmann-Willenbrock, 2012).

On the contrary, both groups had around the same number of positive behaviours within their meetings, contradicting the findings of Kauffeld and Lehmann-Willenbrock (2012) that found a link between meeting citizenship (positive) behaviours with an increase in meeting effectiveness. A plausible explanation for this misalignment from the existing literature could be related to "Humour". Whilst Kauffeld and Lehmann-Willenbrock (2012) included humour behaviour in their positive statements, in this thesis humour was excluded as there was no clear negative counterpart. Still, the observed data suggests that humour behaviour was much more common (4.1% in effective compared to 0.7% in ineffective meetings). Therefore, humour could be the reason why the difference in positive recorded behaviours between effective and non-effective meetings is not existent. Humour could be thus the missing positive behaviour that makes the difference between recorded positive behaviours of effective and noneffective team meetings. These results are in line with previous findings by Lehmann-Willenbrock and Allen (2014) that reported humour as a trigger for socioemotional behaviours in meetings, as well as a relationship between humour behaviours and the overall team performance. In this sense, "Humour" could be seen as a behavioural tendency able to attenuate and moderate potential tensions across team members during team meetings and, in so doing, able to influence the overall effectiveness of the meeting.

Another key finding of this thesis is that teams in effective meetings also react differently to negative feedback compared to teams in ineffective meetings. They reacted to negative feedback not with more negative feedback or other negative meeting behaviours as the non-effective meeting teams, but instead the most common behaviours around them are positive behaviours or behaviours that facilitate the importance of teamwork and collaborative efforts. These included challenging each other in a professional manner and working together as a team. These effective teams displayed a pattern that breaks a negative circle of negative feedback behaviour and turns it into a task that allows the team to improve. Indeed, they accept the negative feedback and challenge each other to work together based on the negative feedback. This is in line with previous research done by Lehmann-Willenbrock, Meinecke, Rowold, and Kauffeld (2015) showing how the effect of leadership behaviour during team interactions can influence the solution focused communication of team members. Within a Scrum team, the changing roles of leadership based on the shared leadership model (Scott-Young et al., 2019) might shift how the mediating role of the leader can influence the communication and solution focus of the scrum work team.

6.3 Scrum Meetings are not All the Same

With regard to the second research question, in the literature, discrepancies in the occurrence of different behaviours between each of the Scrum events have been identified (Sutherland & Schwaber, 2013). The increased number of positive and negative feedback giving behaviours within the Scrum Retrospective supports the idea brought forward by the Scrum guide from Sutherland and Schwaber (2013). They suggest that within the Retrospective the goal of the meeting is for the team to be able to inspect itself and reflect on its own previous work. Within the observed Retrospectives, positive feedback was seen in 2.2% and negative feedback in 1.8% of all behaviours compared to less than 1% within Planning and Review. During Retrospectives, the Scrum team comes up with improvements based on its most recent sprint. As this process requires providing feedback, the higher number of feedback given within this Scrum meeting suggests that these teams perform the principles of the Scrum methodology. Moreover, within the Planning and Review a higher frequency of "Informing with facts" (13.5% and 14.2% compared to 9.5% within the Retrospective) as these meetings are more focused on behaviour that relates to direct planning and reviewing the current work stream compared to the feedback collecting focus of the Retrospective (Sutherland & Schwaber, 2013).

Overall, the occurrence of positive and negative behaviours is different in Scrum team meetings. This difference is evident in both the form of the meetings and how team members' behaviours manifested. In terms of the type of the meeting, this suggests that each type meeting should be treated independently rather than analysing them together. This holds especially true when managerial improvement of meetings is needed. In terms of manifestation of team behaviours, the findings clearly show that teams that are highly effective display a more positive range of behaviours within meetings

compared to ineffective teams as previously suggested by Kauffeld and Lehmann-Willenbrock (2012).

7. LIMITATIONS AND FUTURE RESEARCH

The presented research of this thesis is subject to several limitations. All participants of the Scrum meetings are members of the same Dutch financial organisation which introduces a firm specific bias to all the recorded results. Future research should cover more companies that practise agile and Scrum working methods to decrease this bias as much as possible. It can further be extended to companies not only within software development but other industry sectors, as the introduction of agile working methods is getting embraced outside traditional software development sprints

Furthermore, the low number of teams and recorded meetings may also limit the external validity of this findings. Since the 8 teams that participated in this research are from different departments, this thesis could be extended by increasing not only the overall number of teams, but also the number of teams within a department. Currently it was not possible to see any differences between departments and teams due to the low sample size. Indeed, t-tests were run to explore any statistically significant differences between effective and non-effective meetings. However, these statistics were not statistically significant. This is not surprising given the low sample size. (see Appendix X, XI). To better understand the differences between Scrum events, future studies may require an increase in sample size, in terms of number of teams as well as coverage of Scrum events. This would allow for a stronger quantitative approach to the data.

Moreover, the evaluation of meeting effectiveness has been only scored by the team members themselves introducing self-report and same-source biases. Therefore, in future works the evaluation of meeting effectiveness should be extended to an outside source to evaluate the meeting effectiveness in a natural manner to compare this to the perceived meeting effectiveness seen from the participants.

Lastly, the Thematic Analysis used to identify themes within the recorded meetings followed a deductive approach using a pre-existing codebook and limiting the research behaviours to the proximity to one of the positive or negative behaviours. This thesis could be further enriched by using the same dataset but using an inductive approach towards the recorded meetings to see whether novel behavioural nuances can emerge from them. This would also allow for the evaluation of potential unexplored contextual factors that could shed light on unclear behaviours as well as improve the codebook used to classify the videotaped meetings. For example, through the analysis of all coded behaviours the high frequency of the coded behaviour "Actively listening" (as defined by Hoogeboom and Wilderom (2015)) is the most common behaviour within each meeting. As a result, it was difficult to thoroughly grasp its true meaning and role in relation to team effectiveness. Future research would benefit from a further in-depth differentiation within the behaviours of "Actively listening". This could entail a differentiation between active listening and passive listening to the conversations to better differentiate if someone pays attention during a conversation or is just pretending to do so.

8. CONCLUSION AND IMPLICATIONS

This thesis set out to explore how counterproductive and supporting behaviours manifest themselves within Scrum meetings and to understand how behaviours differ between Scrum events and effective and non-effective meetings. This thesis has extended current research on Agile working methods like Scrum by investigating the relationship between team behaviours and meeting effectiveness More specifically, the contribution of this thesis is twofold. Firstly, it identified both mechanisms of behavioural recurrence, and specific characteristics of verbal behaviours that can help explain team dynamics in relation to high or low Scrum meeting effectiveness. Secondly, it showed and provided explanations of the differences between the three Scrum events (i.e. Planning, Review, and Retrospective) in terms of behavioural patterns, thus offering suggestions on how they should be managed and improved to further team effectiveness.

For practice this research suggests that it is important for managers to notice that the behaviours during a meeting can influence the subsequent behaviours of other team members. This is not only true for positive behaviours but also for negative behaviours. As these are the most disruptive to the meeting process, these should be limited, and team leaders or Scrum team members should be trained in reducing the emergence of circles of counterproductive behaviours to increase the overall meeting effectiveness and satisfaction. Hence, organisations should provide courses through which their employees can develop skills to notice and recognise these negative recurring cycles, as well as to break them changing their communication styles.

Moreover, within the Scrum methodology each event shows a different overall distribution of behaviours. As each of these meetings have a different purpose within the agile working method, it is important not to treat them the same when looking for ways to improve meetings within an organisation. Retrospective meetings need to have a chance to allow for positive as well as negative feedback to properly fulfil their task as a reflection meeting in contrast to the other two that are more focused on task related behaviours.

Lastly, effective and ineffective teams within Scrum handle negative behaviours differently, while having similar reactions to positive behaviour. For managers to improve the working conditions of these teams, the observation of the displayed behaviours during a meeting and the reaction towards negative feedback is the key to improve. Effective teams handle the introduction of negative feedback with positive and teamworking behaviour that is more focused on a solution and positive communication. In contrast ineffective teams deal with negative feedback through disagreement and counterproductive communication that is not focused on a solution. In conclusion, this thesis provides a starting ground for the investigation of meeting behaviour differences within the Scrum framework.

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10. APPENDIX

Appendix I: List of positive and negative behaviour measures

Showing disinterest

It is defined as not showing interest or not taking the issues of another team member seriously. Examples include "not actively listening" or "looking away into the distance" or "actively talking with someone else".

Defending own position

This item is measured through behaviour that involves defending own self-interest or wanting to emphasize own importance. Examples include expressions like "Let me do this, I know exactly how to "and "We're doing it my way".

Providing negative feedback

Providing negative feedback is every behaviour that is related to a negative experience or evaluation in relation to another team member the team or the project itself. Examples are statements like "I am not happy with this" and "This needs to be done differently in the future"

Disagreeing

This item is coded when the behaviour shows a clear disagreement with another team member. Examples include "I disagree with you" and "I don't think this is a good idea"

Agreeing

Agreeing is coded when the behaviour shows a clear agreement with another team member or backs up the ideas of another. Examples include "That is a good suggestion/plan" and "Yes, that's how I see it too"

Active listening

Actively listen is defined as every behaviour when a team member pays attention to the discussion or another team member through listening and comprehension. Examples are statements like "I see" and expressions like "Okay" or summarizing what a team member just said.

Providing positive feedback

Providing positive need back describes every behaviour where a team member raises the status of feeling of another by judging or rewarding them in a positive manner. This includes praise as "You provided fine work" and "That's nice" or thanking another as in statements like "Thank you" and "Good idea, thank you"

Asking for ideas

Asking for ideas is defined as the behaviour where a person asks for input and opinions of a team member or stimulates the team to think along with them. Examples are statements like "How did you like it?", "What do you think should be our goal?" or "I'm interested to hear your thoughts on…"

Appendix II: Table 3: Frequencies of observed behaviours extended

Behaviours *Absolute and relative frequency of observed behaviours*

	Total	Scrum events			Ineffective meetings	Effective meetings
		Planning	Review	Retrospective		
Total	15778	7554	4927	3297	3455	3555
Agreeing	741 4.70%	320 4.24%	260 5.28%	161 4.88%	134 3.88%	169 4.75%
Giving positive feedback	137 0.87%	50 0.66%	16 0.32%	71 2.15%	18 0.52%	25 0.70%
Asking for ideas	71 0.45%	36 0.48%	22 0.45%	13 0.39%	34 0.98%	11 0.31%
Actively listening	6770 42.91%	3228 42.73%	2146 43.56%	1396 42.34%	1471 42.58%	1504 42.31%
Disagreeing	144 0.91%	57 0.75%	59 1.20%	28 0.85%	61 1.77%	12 0.34%
Giving negative feedback	88 0.56%	16 0.21%	14 0.28%	58 1.76%	21 0.61%	3 0.08%
Defending own position	116 0.74%	43 0.57%	44 0.89%	29 0.88%	3 0.09%	24 0.68%
Showing disinterest	348 2.21%	259 3.43%	33 0.67%	56 1.70%	176 5.09%	73 2.05%
Informing with facts	2031 12.87%	1016 13.45%	700 14.21%	315 9.55%	306 8.86%	443 12.46%
Giving own opinion	1739 11.02%	775 10.26%	558 11.33%	406 12.31%	521 15.08%	369 10.38%
Verifying	1254 7.95%	658 8.71%	400 8.12%	196 5.94%	275 7.96%	270 7.59%
Governing/Correcting	39 0.25%	12 0.16%	21 0.43%	6 0.18%	8 0.23%	4 0.11%
Governing/Delegating	47 0.30%	35 0.46%	9 0.18%	3 0.09%	13 0.38%	12 0.34%
Governing/Interrupting	655 4.15%	318 4.21%	243 4.93%	94 2.85%	180 5.21%	192 5.40%
Shaping the discussion	348 2.21%	150 1.99%	105 2.13%	93 2.82%	59 1.71%	68 1.91%
Giving direction/Long term	4 0.03%	2 0.03%	0 0.00%	2 0.06%	0 0.00%	0 0.00%
Professional challenging/Stimulating teamwork	136 0.86%	88 1.16%	24 0.49%	24 0.73%	12 0.35%	62 1.74%
Humour	582 3.69%	220 2.91%	185 3.75%	177 5.37%	25 0.72%	144 4.05%
Giving positive attention/Being friendly	34 0.22%	20 0.26%	7 0.14%	7 0.21%	5 0.14%	10 0.28%
Giving positive attention/Showing personal interest	43 0.27%	9 0.12%	13 0.26%	21 0.64%	6 0.17%	3 0.08%
Focussed task behaviour	151 0.96%	105 1.39%	6 0.12%	40 1.21%	21 0.61%	98 2.76%
Null behaviour	255 1.62%	122 1.62%	52 1.06%	81 2.46%	94 2.72%	56 1.58%
Sum of all negative behaviour	4.41%	4.96%	3.04%	5.19%	7.55%	3.15%
Sum of all positive behaviour	6.01%	5.37%	6.05%	7.43%	5.38%	5.77%

Appendix III: Table 4: Summary table three behaviours before and after positive or negative behaviour

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	1534	**14.0**	12.6	42.6	5.4	8.0	0.4	1.8	1.1	3.4	0.1	0.4	1.2	0.7	0.9
Defending own position	658	0.3	11.1	48.9	7.1	5.8	0.5	5.2	2.7	4.3	**2.0**	0.0	0.6	1.5	1.4
Giving negative feedback	490	3.9	8.6	48.2	9.4	6.1	0.8	1.8	1.8	5.9	1.6	0.6	1.2	1.6	**3.3**
Disagreeing	781	2.6	11.9	47.0	14.0	5.8	0.4	0.5	0.8	3.6	0.5	0.6	**3.6**	0.1	0.9
Asking for ideas	418	2.6	**7.4**	50.0	**16.3**	3.8	1.0	2.4	2.2	4.3	0.0	0.5	1.2	0.0	0.5
Giving positive feedback	725	1.8	**12.0**	47.0	9.1	5.5	0.3	3.7	5.1	3.2	1.2	0.0	0.1	**5.0**	1.1
Agreeing	3766	1.4	**9.0**	48.7	**14.6**	6.1	1.1	1.3	2.5	**6.2**	0.6	0.4	0.6	0.7	0.7

Appendix IV: Table 5: Summary table three behaviours before positive or negative behaviour

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	855	**15.1**	14.7	41.4	4.8	6.2	0.6	1.9	1.3	2.3	0.1	0.5	1.5	0.8	0.9
Defending own position	342	0.3	11.7	49.7	5.8	5.3	0.6	5.0	2.3	2.9	**2.0**	0.0	0.9	2.3	1.5
Giving negative feedback	260	4.2	10.4	49.2	8.8	5.4	1.2	2.3	3.1	4.6	1.5	0.4	0.0	2.3	**3.1**
Disagreeing	417	2.4	7.9	49.9	15.1	5.5	0.5	0.5	1.0	2.4	0.5	0.5	**3.8**	0.2	1.7
Asking for ideas	213	2.8	**8.0**	49.8	**14.6**	2.8	1.4	1.9	4.2	4.7	0.0	0.5	1.4	0.0	0.9
Giving positive feedback	396	1.3	**14.4**	48.7	9.3	3.8	0.3	3.0	5.1	3.5	0.5	0.0	0.0	**4.8**	0.5
Agreeing	2088	1.7	**9.7**	46.4	**16.2**	5.6	1.3	0.9	1.7	**6.2**	0.8	0.3	0.8	0.7	1.0

Appendix IV: Table 6: Summary table three behaviours after positive or negative behaviour

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	855	**15.1**	10.4	42.2	5.8	9.7	0.4	1.4	0.8	3.9	0.1	0.5	1.1	0.6	1.1
Defending own position	342	0.3	10.5	48.2	8.2	6.4	0.3	5.3	3.2	5.3	**2.0**	0.0	0.6	0.6	1.2
Giving negative feedback	260	3.1	6.2	48.8	9.6	6.2	0.8	1.2	0.4	**7.7**	1.9	0.8	2.3	0.8	**3.1**
Disagreeing	417	2.9	14.6	44.6	13.4	5.5	0.2	0.5	0.5	4.3	0.7	0.7	**3.8**	0.0	0.0
Asking for ideas	213	2.8	**6.6**	49.8	**17.4**	5.2	0.5	2.8	0.0	3.8	0.0	0.5	0.9	0.0	0.5
Giving positive feedback	396	2.0	**10.1**	46.7	8.8	6.6	0.3	4.5	4.8	3.3	2.0	0.0	0.3	**4.8**	1.5
Agreeing	2088	1.0	**7.8**	52.1	**13.3**	6.5	0.7	1.6	3.1	6.2	0.5	0.5	0.5	0.7	0.6

Appendix V: Table 7: Summary table three behaviours before and after positive or negative behaviours in Sprint planning

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	1092	**16.4**	12.5	41.7	5.3	7.7	0.5	1.6	1.0	3.1	0.1	0.5	1.1	0.3	0.6
Defending own position	245	0.4	11.8	48.6	8.6	6.9	1.2	3.7	2.0	2.4	**2.0**	0.0	0.0	1.2	0.4
Giving negative feedback	89	11.2	5.6	48.3	9.0	7.9	2.2	0.0	0.0	**5.6**	1.1	2.2	1.1	2.2	0.0
Disagreeing	302	4.6	11.3	47.7	12.3	6.3	0.7	0.7	0.7	2.6	0.0	1.0	**4.6**	0.3	0.3
Asking for ideas	211	4.7	**7.6**	49.8	**15.2**	3.8	0.5	1.9	2.4	3.8	0.0	0.9	1.4	0.0	0.5
Giving positive feedback	268	1.5	**13.4**	48.1	9.0	7.5	0.4	0.7	3.4	3.7	1.1	0.0	0.4	**4.5**	0.7
Agreeing	1626	2.3	**9.3**	48.5	**13.7**	6.9	1.4	1.4	2.0	**6.6**	0.4	0.4	0.4	0.7	0.2

Appendix VI: Table 8: Summary table three behaviours before and after positive or negative behaviours in Sprint review

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	142	**14.8**	12.0	43.0	7.7	9.2	0.0	0.0	1.4	2.8	0.0	0.0	1.4	0.0	0.0
Defending own position	243	0.0	11.1	51.0	5.3	5.3	0.0	3.7	2.9	**7.8**	**2.5**	0.0	1.2	0.4	1.2
Giving negative feedback	78	0.0	10.3	46.2	11.5	5.1	0.0	0.0	0.0	6.4	3.8	0.0	2.6	0.0	**2.6**
Disagreeing	317	0.3	13.6	45.4	15.8	5.4	0.3	0.3	0.3	3.8	0.9	0.0	**3.8**	0.0	0.6
Asking for ideas	129	0.0	6.2	52.7	**17.1**	5.4	0.8	1.6	1.6	5.4	0.0	0.0	0.0	0.0	0.0
Giving positive feedback	87	0.0	**6.9**	51.7	9.2	4.6	0.0	3.4	8.0	3.4	1.1	0.0	0.0	**5.7**	0.0
Agreeing	1289	0.3	8.8	49.0	**14.9**	5.4	0.8	1.5	2.6	**6.8**	1.2	0.5	0.8	0.3	0.3

Appendix VII: Table 9: Summary table three behaviours before and after positive or negative behaviours in Sprint retrospective

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	300	**5.0**	13.3	46.0	4.7	8.7	0.0	3.0	1.3	4.7	0.3	0.3	1.7	2.7	2.3
Defending own position	170	0.6	10.0	46.5	7.6	4.7	0.0	9.4	3.5	1.8	**1.2**	0.0	0.6	3.5	2.9
Giving negative feedback	323	2.8	9.0	48.6	9.0	5.9	0.6	2.8	2.8	**5.9**	1.2	0.3	0.9	1.9	**4.3**
Disagreeing	162	3.1	9.9	48.8	13.6	5.6	0.0	0.6	1.9	4.9	0.6	1.2	**1.2**	0.0	2.5
Asking for ideas	78	1.3	**9.0**	46.2	**17.9**	1.3	2.6	5.1	2.6	3.8	0.0	0.0	2.6	0.0	1.3
Giving positive feedback	370	2.4	**12.2**	45.1	9.2	4.3	0.3	5.9	5.7	2.7	1.4	0.0	0.0	**5.1**	1.6
Agreeing	851	1.3	**8.6**	48.6	**15.7**	5.6	0.8	0.9	3.3	4.6	0.4	0.4	0.7	1.4	2.4

Appendix VIII: Table 10: Summary table three behaviours before and after positive or negative behaviours in effective meetings

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	326	**15.0**	11.7	42.0	5.5	7.7	1.5	2.5	0.0	2.5	0.3	0.0	0.0	0.3	0.0
Defending own position	131	0.8	6.9	48.9	11.5	5.3	2.3	3.8	0.0	0.8	**3.8**	0.0	0.0	1.5	0.0
Giving negative feedback	15	0.0	6.7	46.7	13.3	0.0	**6.7**	0.0	0.0	**20.0**	0.0	0.0	0.0	**6.7**	**0.0**
Disagreeing	69	0.0	8.7	53.6	18.8	2.9	0.0	1.4	1.4	**5.8**	0.0	2.9	0.0	0.0	0.0
Asking for ideas	66	0.0	**12.1**	54.5	**9.1**	4.5	1.5	0.0	0.0	10.6	0.0	0.0	3.0	0.0	0.0
Giving positive feedback	136	0.7	**11.0**	50.0	9.6	6.6	0.0	0.7	3.7	4.4	1.5	0.0	0.0	**5.9**	0.7
Agreeing	844	0.7	**6.9**	48.9	**16.0**	6.2	1.8	0.9	3.0	7.2	0.1	0.6	0.5	0.7	0.2

Appendix IX: Table 11: Summary table three behaviours before and after positive or negative behaviours in non-effective meetings

Behaviour		*Showing disinterest*	*Informing with facts*	*Actively listening*	*Giving own opinion*	*Verifying*	*Professional challenging/Stimulating teamwork*	*Humour*	*Shaping the discussion*	*Agreeing*	*Defending own position*	*Asking for ideas*	*Disagreeing*	*Giving positive feedback*	*Giving negative feedback*
	Total	*Relative frequency of selected behaviours in %*													
Showing disinterest	731	16.4	12.3	41.6	5.7	7.9	0.0	1.1	1.2	3.7	0.0	0.5	1.6	0.3	1.0
Defending own position	18	0.0	11.1	55.6	11.1	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6
Giving negative feedback	122	8.2	10.7	42.6	13.9	6.6	0.0	1.6	0.0	0.8	0.8	2.5	2.5	2.5	0.0
Disagreeing	322	4.3	9.3	46.3	14.3	6.8	0.6	0.0	0.3	3.4	0.0	0.3	4.3	0.3	0.9
Asking for ideas	196	4.6	5.1	48.5	19.4	4.6	0.0	2.0	2.6	1.5	0.0	1.0	0.5	0.0	1.0
Giving positive feedback	99	3.0	14.1	37.4	15.2	6.1	0.0	2.0	4.0	2.0	0.0	0.0	1.0	4.0	3.0
Agreeing	702	4.6	6.7	48.3	15.0	7.5	0.6	0.4	1.0	5.8	0.0	0.4	1.3	0.4	0.1

Appendix X: Table 12: Exploratory T-test results effective and non-effective meetings negative

	Effective meeting	*Non-effective meeting*	*Effective meeting*	*Non-effective meeting*	*Effective meeting*	*Non-effective meeting*	*Effective meeting*	*Non-effective meeting*
	Showing disinterest		***Defending own position***		***Disagreeing***		***Giving negative feedback***	
Mean	24.333	44	8	33.5	4	15.25	1	5.25
Variance	966.333	6837.333	7	118.333	27	38.91667	3	18.25
Observations	3	4	3	4	3	4	3	4
Hypothesized Mean Difference	0		0		0		0	
df	4		3		5		4	
t Stat	-0.436		-4.514		-2.599		-1.802	
P(T<=t) two-tail	0.685		**0.020**		**0.048**		0.146	
t Critical two-tail	2.776		3.1825		2.571		2.776	

Appendix XI: Table 13: Exploratory T-test results effective and non-effective meetings positive

	Effective meeting	*Non-effective meeting*	*Effective meeting*	*Non-effective meeting*	*Effective meeting*	*Non-effective meeting*
	Asking for ideas		***Agreeing***		***Giving positive feedback***	
Mean	3.667	8.5	56.333	33.5	8.333	4.5
Variance	9.333	51	2074.333	118.333	22.333	19.667
Observations	3	4	3	4	3	4
Hypothesized Mean Difference	0		0		0	
df	4		2		4	
t Stat	-1.214		0.850		1.090	
P(T<=t) two-tail	0.292		0.485		0.337	
t Critical two-tail	2.776		4.303		2.776	