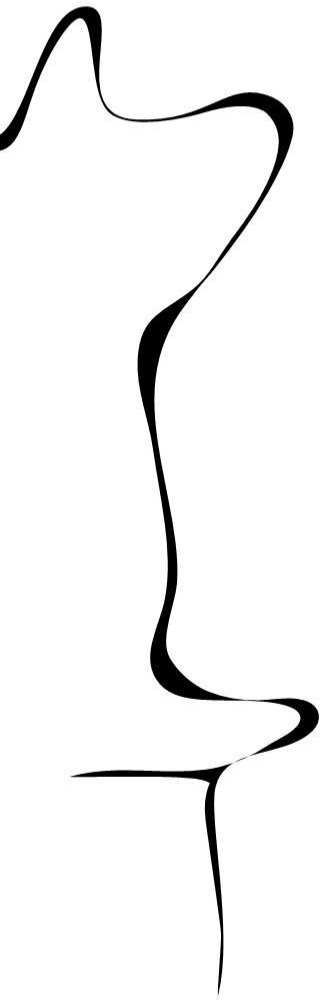


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Regulatory interaction and the adoption of regulatory roles in teams at the workplace.

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Abstract

Individuals take on different regulatory roles and have different ways of interacting with each other. These different roles and interaction types will influence the quality of social-regulation in teams. Research about the social-regulation and roles at the workplace setting is scarce but important, because society is constantly and rapidly changing. Individuals need to regulate their behaviour to get good performances, as is desired by this society. This study explored different regulatory interaction types and different regulatory roles that individuals take on at a workplace context, and how these roles and interaction types interact with each other. Video-observations of retrospective team meetings from the software development sector were used to analyse these different regulatory roles and interactions. Next, a coding scheme was developed for the workplace setting. Noticeable results were that there was a significant interaction between the roles and the interaction types. Some roles and interactions were dysfunctional for the quality of social-regulation of the team. Engaged and accepted interaction types occurred the most and seemed to have a relation with roles which were known to cause a high-quality of social regulation in a team. Although more research is needed, the findings of this present study could give an indication on how a team with a high-quality social regulation should interact and which roles should be adopted.

Keywords: social-regulation, workplace, interaction types, regulatory roles

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Introduction

Regulation (at the workplace)

In the 21st century, a lot is asked from employees at the workplace, especially from employees in the software development sector (Moe, Dingsøyr, & Dyba, 2008). They have to self-regulate their behavior, deal with time pressure and conflicting deadlines and manage their knowledge, emotions, selective attention and behavior to perform well (Lord, Diefendorff, Schmidt & Hall, 2010; Schmidt & DeShon, 2007; Newell, 1990). Agile software development also relies heavily on teamwork (Moe et al., 2008). Often these software development teams use a method called Scrum. Scrum is a popular method, because a scrum team has the responsibility, freedom and authority to self-regulate their work and is therefore a good method for agile software development (Moe, Dingsøyr, & Dybå, 2010).

Sitzmann and Elly (2011) stated that “self-regulation enables people to function effectively in their personal lives as well as to acquire knowledge and skills needed to succeed in higher education and the workforce” (p.421). So, self-regulation is considered to be very important for increasing, or further improving the quality of performance at the workplace. Also, an important characteristic of the workplace is that employees often need to work together with coworkers or in teams. As a result, employees need to not only self-regulate, but also regulate their social behaviors (Lord et al., 2010). For example teams in the software development sector, who rely on feedback, communication, shared goal setting, planning and monitoring (Moe et al., 2008). Yet, most research is done about self-regulation, which focusses on processes within the individual rather than processes between individuals. Consequently, these socially shared regulation processes, in software development teams, are not well known even though they play such an important role within these teams (Moe, Dingsøyr, & Dyba, 2008; Lord et al., 2010). Vauras, Iiskala, Kajamies, Kinnunen, and Lehtinen (2003) agreed with this view. In their research, they found that, while working in teams, there is constant monitoring and regulation of collective activity. This cannot be reduced to individual activity.

In addition, research has shown that when working in teams, individuals will take on different roles (Volet, Vauras, Salo, & Khosa, 2017). Volet et al. (2017) emphasized that these roles will influence the quality of social-regulation in a group. Research about regulatory roles is scarce, especially for the workplace setting. Tynjälä (2008) said that because of the constant and rapid change in working life, lifelong learning and learning in the workplace is very important for organisations as well as for individuals. This makes high

quality regulation, and therefore the regulatory roles which support that, important to look at.

When regarding research about regulation, a lot of research is done in an academic context. This has to be taken into account, because the academic context is significantly different from the work context (Tynjälä, 2008). Tynjälä (2008) stated that learning in an academic setting is a more reproductive activity, that focusses more on individual cognitive processes and has a totally different environment than a workplace setting. Learning outcomes are measured by tests and the focus lies more on thinking rather than action. However, learning at the workplace is less premeditated, less explicit and very contextual (Tynjälä, 2008). This could make processes such as monitoring, evaluation and goal setting highly important for the workplace setting. Workers have to regulate their behaviour to successfully cooperate with their team members. The difference compared to students in an academic setting, is that students are working in a more pre-designed context.

In summary, regulation processes between individuals play an important role at the workplace. Individuals take on roles which will influence the quality of regulation between individuals in a team. Research about the social-regulation and roles at the workplace setting is scarce but important, because regulation at the workplace becomes a necessity for this rapid and constant changing society. Therefore, this study aims to provide insight in to what extent individual team member take on different regulatory roles and whether these roles are beneficial or dysfunctional for teams at the workplace.

Theoretical Framework

Social regulation and interaction between team members

Regulation is a goal-directed process, because it always occurs when there is a goal or a standard. Performance is then monitored through progress or achievement of a goal or a standard (Hadwin et al., 2011; Winne & Hadwin, 1998). Monitoring, controlling the controlled variable, planning and evaluating are the metaprocesses that regulation includes (Schoor, Narciss & Kondle, 2015). First of all, after planning, the value of the controlled variable is monitored. This value will be evaluated against a goal of a standard. If the evaluation reveals discrepancies towards the goal, action could be taken. An example of a said action could be changing a work strategy, like working more systematically. As previously stated, regulation occurs in individuals but also in groups, and therefor play an important role in efficient group work (Vauras et al., 2003).

Because of the importance of regulation in group work, the concept of social-regulation gained interest. The term social regulation is used when a group as a whole

regulates itself (Schoor, Narciss and Körndle, 2015). There are variations in the quality of social regulation in groups, but so far, there is not much information about why these variations exist (Rogat & Linnenbrink-Garcia, 2011). Volet, Summers and Thurman (2009) found big differences in types of interaction in groups. They made a framework for socially-regulated learning that contains two constructs, namely social regulation and content processing as continuous dimensions. They distinguish high-level content-processing, meaning the construction of meaning, and low-level content-processing, meaning acquisition of knowledge. The result of this study was that the quality of regulation depended on whether a group member showed a low-level simple exchange of information or a high-level one, namely engaging in each other's contributions together. Also, four factors appeared to play a role in the groups' tendency to engage in high-level exchange of information. These factors were: question-asking; tentativeness, background-knowledge and shared positive emotions. Rogat and Linnenbrink-Garcia (2011) found some similar features of interaction that caused high-level social regulation. Collaboration between sub-processes of regulating activities, like planning, monitoring, behavioral engagement, and shared conceptual understanding caused high-level social-regulation. Molenaar (2011) also found that interaction between group members influences the quality of social-regulation. She makes a distinction between four different types of interaction. These different types describe social-regulatory activities in the groups' interaction. The first type of interaction is called ignored. This interaction occurs when a group member attempts to regulate an activity within the group, but the other group members ignore it. The second type of interaction is called accepted. When a group member tries to regulate something within the group, other group members react to it with a contributive action. The third form of interaction are shared regulatory activities. This occurs when a group member shares a regulatory idea and other group members react on each other's input. The last type of interaction is called co-constructed regulatory activities. An example of a co-constructed regulatory interaction is when a group member evaluates on a fault in the planning of the group. Another group member also comments and says that he thinks that there could be problem with it and justifies his comment. A third group member evaluates the comments that are made by these group members. Molenaar (2011) found out that ignored activities are never beneficial for the group process. Accepted and shared activities have a great chance to facilitate the group process and finally, co-constructed activities are most likely to benefit the group. This framework was used by Wijga and Endedijk (2017) in a study about social regulation processes in an IT setting. They found out

that some modifications were necessary for this context. This was because the workplace setting differed too much from the academic setting considering that in the academic setting, students have to do a task on spot. At the workplace setting, this is not the case and the interaction is mostly about tasks that have to be done after the meeting. Therefore the distinction between sharing and co-construction was not relevant. Their findings resulted in four new categories, namely initiating, ignoring, accepting and engaging.

Like earlier mentioned, agile development teams often work with the Scrum method. The Scrum method enables a team to, for example, self-regulate their work (Moe, Dingsøyr, & Dybå, 2010). Scrum is a development process, which is mostly used for small teams, and works with so called “sprints”. These sprints are short development phases. In these sprints the team plans, evaluates, and delivers a product. With scrum, it is also of importance to evaluate, not only the product, but also the team process. These team process evaluations are called retrospectives. There are three roles when working with scrum, namely the product owner, the team and the scrum master. The product owner is the client and knows how the product should be like. The team is responsible for designing and making the product and the scrum master, as a co-developer often part of the team, guides the collaboration process.

In sum, research has shown that how individuals react to each other, while working in groups, influences the quality of social-regulation of the group. What Molenaar (2011), Volet, Summers and Thurman (2009) and Rogat and Linnenbrink-Garcia (2011) all have in common is the fact that most shared and co-constructed interaction activities in a group are causing high-level social-regulation.

Regulatory roles in team interactions

As said above, different interactions between team members cause high- or low level social-regulation. While interacting, individuals in a group will take on different roles which could influence the quality of social-regulation. Volet, Vauras, Salo, and Khosa (2017) define roles as “specific strategies and behaviors used by an individual in a particular situation, resulting from interaction with others and characteristics of the individual in question” (p.80). Rogat and Linnenbrink-Garcia (2011) found that for example asking questions and sharing positive emotions had a positive effect on the quality of social-regulation. When taking on roles that causes these behaviors or interactions, it could cause beneficial or dysfunctional interactions, and therefore it is important to take roles into account when looking at social-regulation.

There is no list of universally accepted roles, because roles are very situational and contextual (Stewart, Fulmer & Barrick, 2005). Benne and Sheats (1948) tried to make such a taxonomy for roles. After observing groups, they classified their observed roles (27) into three categories, namely group task roles, group building and maintenance roles and individual roles. Group task roles are aimed at the task which the group is undertaking or is going to undertake. Examples of group task roles are a contributor or an information seeker. Group building and maintenance roles are focused toward the groups' regulation, for example a harmonizer role. The individual roles are directed towards the needs of the individuals in the group. They don't concern group tasks and an example of an individual role is a recognition seeker.

A more recent study by Chiu (2000) came up with five productive roles, namely a facilitator, a proposer, a supporter, a critic and a recorder. The facilitator monitors the groups' process and harmony, while also inviting participation of the group members. The proposer comes up with new ideas. The supporter evaluates the proposed idea by the proposer and tries to justify and elaborate it. The critic will challenge the idea that the proposer suggested and lastly, the recorder will summarize the progress of the group. The importance of Chiu's research is that it combines individual action with social interaction, which helps individuals to benefit from working in a group. An important similarity between Benne and Sheats (1948) and Chiu (2000) is that roles are flexible. That means that individuals can take on multiple roles depending on the situation that they are in.

One of the most recent studies about individual regulatory roles in group is the study from Volet et al. (2017). They followed up on the information gained in the studies of Chiu (2000) and Benne and Sheats (1948). Volet et al. (2017) came up with a coding scheme of different roles (10) within the groups. In their coding scheme they distinguished content, performance and evaluation focused roles and one social role namely the harmonizer role. Next to making a coding scheme, they also did a metacognitive regulation analysis. They coded the forms; socially shared metacognitive regulation, metacognitive other regulation, ignored metacognitive regulation and verbalized metacognitive self-regulation, which have similarities with Molenaars'(2011) metacognitive interaction activities. Volet et al. (2017) concluded that "there was a clear link between the quality of the group-outcome and group members' adoption of content-focused roles –especially those that were knowledge focused – and their playing multiple roles flexibly in interaction, as required by the evolving situation" (p.90). Their results show that in groups with high quality social-regulation, individuals take

on roles that cause understanding and roles that focus on content. These roles could therefore be an indication for the quality of social-regulation within a group.

Present study

The aim of this study is to gain insight in the regulatory roles played in team interactions at the workplace, and whether these roles are beneficial for the teams' work. Most of the research on this topic is done in an academic setting, but when considering the differences, it is definitely useful to explore the workplace context, because regulating behavior is essential for successful teamwork at the workplace (Tynjälä, 2008). Molenaar (2011) found four types of interaction which influenced the group process. Wijga and Endedijk (2017) made some modifications to Molenaars' (2011) framework to make it more suitable for the workplace setting. The knowledge provided by these studies could give us insight in which of these interaction activities are beneficial at the workplace setting. When regarding regulatory roles in team interactions, the research done by Volet et al. (2017) could be a great source of knowledge for this present study. It is yet unclear if their findings are applicable to the work context, so no hypotheses are formulated. The research questions that will be answered in this study are:

- 1. Which types of regulatory interaction occur in a workplace context?*
- 2. To what extent play different individuals different regulatory roles in teams at the workplace?*
- 3. How do roles and interaction types interact with each other in a workplace context?*

Method

Participants

In total, three development teams participated in this study. These teams were from two different companies in The Netherlands. Table 1 provides the descriptive information about these three teams. All these teams were composed by the company and did their jobs without intercession of the researchers. In this study, two different retrospective meetings per team were filmed with a 360-degree camera. Retrospective meetings were chosen based on the fact that within these meetings, more discussion and evaluation would be observed than in normal sprint meetings.

Table 1

Descriptive information teams

	Team size	Gender		Age in years	
		Male	Female	<i>M</i>	<i>SD</i>
Team A	6	4	2	39	9.79
Team B	5	5	0	38	4.03
Team C	5	4	1	49	9.36

Procedure

During a presentation, information about the research was given to the management teams of the organizations that were asked to participate. After this informative meeting, the management teams informed the development teams about the purpose and procedure of this study. If the development teams were interested in participating, they could sign up for a meeting with the researchers. This choice was not pressured by the management teams, so it was entirely voluntary. When the teams were interested and willing to meet the researcher, the researcher explained the aim of the study, the procedure, how they would handle the teams' privacy and the time investment asked from the teams. Confidentiality was assured. This was done to each team individually. The teams were also told that the decision to participate should only be made if every team member agreed on participating. Subsequently, the teams that were willing to participate could join a pilot study of two weeks before deciding to participate in the main study. The data of six teams was gathered, and three teams

were chosen for this specific study. They were chosen based on their sample size, different company and availability of enough data of retrospective meetings. At the start of the main study, every team member signed an informed consent to ensure that they understood what it meant to participate in this study. This was all done according to research ethics. The demographic data (table 1) was acquired via surveys and the other data was obtained by video recordings with a 360-degree camera. A researcher or a team member had to turn on the camera before the beginning of the meetings. Participants were told to ignore the camera to ensure that it did not influence their behavior. The pilot study helped the participating teams to get used to the camera. The recorded video-data is of meetings where the progress of the development process was discussed, and these recordings were between 10 and 120 minutes long. The participants talked about private family matter etc. in the video data and this suggests that the participants felt safe while being recorded.

Data-analysis

In total six videotaped retrospective team meetings were used for this research (two per team). The software Observer XT (version 14.1) was used to code the video data. This software could provide time-logged codes and the frequencies and duration of interactions. The data was coded by one researcher and extensively checked by another researcher for a better reliability. Table two contains the coding scheme used in this research. Data from Molenaar (2011), Volet et al. (2017) and Wijga and Endedijk (2017) was used. The first step was to code the perceived interaction type, namely: initiated, ignored, accepted or engaged (Wijga and Endedijk, 2017, Molenaar, 2011). The second step was to code the roles that team members adopted (Volet et al., 2017). Because the research of Volet et al. (2017) was done in an academic context, we would stay open for finding different roles.

First, the coded data was put in excel and the statistical program SPSS, and the researcher checked for any inconsistencies in the gathered data. Firstly, the researcher looked at data of the interaction types. The percentage of occurrences of the different interaction types were calculated after which these percentages were checked with the non-parametric Friedman test. This was done because it was important to know if there was a significant difference between these interaction types for the workplace setting. Secondly, the researcher calculated the percentage of occurrences for the different roles, also with the non-parametric Friedman test. Subsequently, the coding scheme was adjusted based on the findings to better suit the specific context. Again, all videos were coded with the new coding scheme and this data was tested in a similar way as the old data. Thirdly, data profiles were created in

Observer XT to gain more insight in when roles interacted with different interaction types. The data showed how often a subject showed an interaction type and a role at the same time. To see if there was a significant relation between the roles and the interaction types, a Chi-square test was conducted.

Table 2

Description of codes and sub codes

Codes	Description
Interaction types (see Molenaar (2011, p. 120) and Wijga & Endedijk (2017, p 11))	
Initiated	“When a team member introduces a new topic with a regulation activity.”
Ignored	“When the group members do not relate nor engage in another group member’s metacognitive activity”.
Accepted	“When the group members engage in a metacognitive activity with a cognitive activity”.
Engaged	“When a group member relates or engages in each other’s regulation activities by further specifying, adapting or clarifying the previous regulation activity.”
Roles (see Volet et al. (2017, p. 84))	
Information seeker (IS)	“IS seeks for facts and information related to content, without a critical approach. If a person is trying to get a deeper understanding of content, or asks for interrelations or cause and effect it is coded as ‘KS’”.
Information giver (IG)	“IG offers facts and information related to content without a critical approach, elaboration or scientific explanations. IG may also provide information in question form, when seeking for confirmation”.
Knowledge seeker (KS)	“KS is interested in receiving deeper knowledge to understand issues related to the content, without being critical to previous comments. KS may also initiate something new by bringing up a question related to possible solutions. KS is interested in cause and effect and interrelations”.
Knowledge provider (KP)	“KP offers elaborated information and scientific explanations, without a critical or challenging approach. KP may shape the statements of others by introducing how they would work out if adopted by the group. KP may also express causal relations, provide new solutions related to content and thereby initiate something new”.

Opinion seeker (OS)	“OS invites others to express their opinion in something dominantly related to procedures. OS is not interested in getting facts or knowledge. OS may want to know, for example, which alternative should be chosen or how the team should proceed or initiate a new procedural approach”.
Opinion giver (OG)	“OG expresses an opinion that is dominantly related to procedures, for example, by telling which solution, alternative or approach the group should choose. OG does not offer information or facts. OG does not challenge someone else's opinion or criticizes, like challenger does”.
Follower (FO)	“FO either agrees or is indifferent with the suggestions made/information provided. FO may agree verbally or just nod, or may state that they do not know or that they are ready to go along the group”.
Supporter (SU)	“SU repeats suggestions or ideas with added clarity. SU does not elaborate, questions nor disagrees but states previous comments in other words, thus clearly supporting them. SU presents supportive additions or proposals, e.g. a statement or question, when looking for a confirmation”.
Challenger (CH)	“CH puts previous comments to the test by asking for clarification or disagreeing with ideas and suggestions, showing interest in exploring alternatives. CH may volunteer counter proposals that invite others to evaluate his/her criticism, or invite others to evaluate suggestions, which promotes the consideration, critique and possible rejection of multiple possibilities. CH may challenge content related or procedural matters”.
Harmonizer (HA)	“HA tries to have a positive effect on the group atmosphere. HA may praise the group or a member for good work, may try to resolve conflicts, sometimes using humor and telling jokes”.

Results

Research question 1: What types of interaction do we see in a working context?

The total of perceived interactions are shown in figure 1. To check whether the differences between these interaction types are significant, a non-parametric Friedman test of differences among the interaction types was conducted. The test rendered a Chi-square value of 10.089 which was significant ($p = .018$). Figure 4 shows all the percentages of the different interaction types per team.

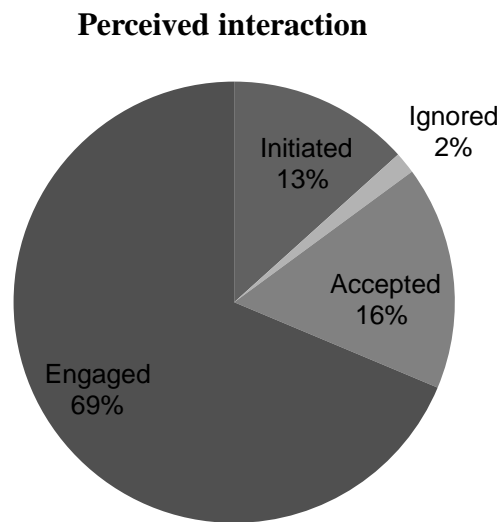


Figure 1. All perceived interaction of all participants in percentages.

Research question 2: To what extent play different individuals different regulatory roles in teams at the workplace?

During coding the roles, the role *non-specified role* was added for roles that could not be coded with the coding scheme of Volet et al. (2017). After all the videos were coded, the data was checked with the non-parametric Friedman test, to see if the roles differed from each other in a work setting and a significant difference was found, $\chi^2(10) = 194.011$, $p = .000$. During the coding process, it became clear that some alternations were necessary to better suit the workplace context. Some team members adopted the harmonizer role by admitting their errors and being vulnerable. An example from the videos would be (“*I am maybe also a bit too flexible, and I get a lot of questions, and sometimes I do that too much*”). Therefore, the description of the harmonizer role was elaborated by adding ‘*or by being vulnerable and admitting his/her errors*’. Next to that, it became apparent that some team members adopted a role which was disharmonizing for the team. For example a part of a conversation between

two team members was;

A: “I get irritated about some things constantly, things like it’s windows, it’s your problem, your computer, you figure it out yourself.”

B: “Exactly, that is not good for my motivation.”

A: “It is not motivating for me also, I use Linux not windows so whatever, I do not know. I want to bring it more positively but, yea, pick up the manual, I do not think I am the only one who can read.”

B: “No, yes, there we go again, such answers again.

Other examples from the videos would be totally ignoring another team members comment or suggestion or saying things like “Are you deaf or something?” or

A: “What went well this sprint?” B: “Nothing” and “They were not better, only worse”.

Therefore, an extra role was added to the coding scheme, namely disharmonizer (DH). The disharmonizer role is defined as follows: “DH has a negative effect on the group atmosphere. DH may make offensive or cynical comments or jokes that have a negative effect on the group. DH may complain and challenge ideas without being open for solutions or suggestions”. Lastly, the role *non-specified* was left out. The new coding scheme is added in appendix A.

After coding the videos again with the new coding scheme, the data was checked again with the non-parametric Friedman test. Again, a significant difference was found which indicates the new role really differs from the other roles, $\chi^2(10) = 81.529, p = .000$. As seen in figure 2, the role *follower* is perceived the most by far. Because of this, the figure does not really show us clearly how the other roles behave in relation to each other.

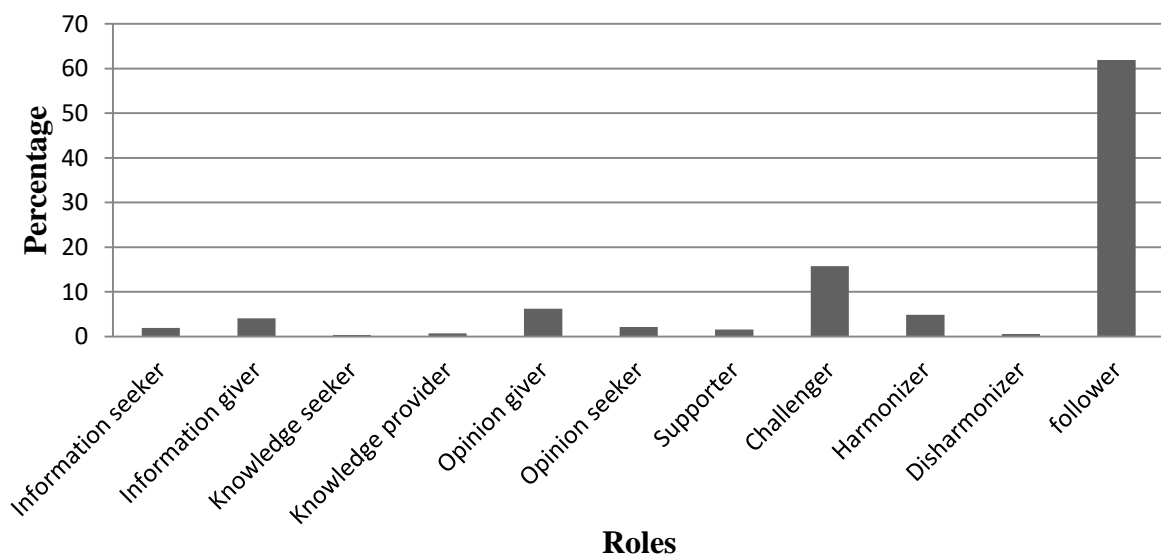


Figure 2. All perceived roles of all participants in percentages.

To get a better insight in the relations between the other roles, the role of *follower* is left out in figure 3. Note that this does not mean that the follower role is of less importance. In figure 3, it is visible that the challenger (41%), the harmonizer (13%), the opinion giver (16%) and the information giver (11%) occur the most. The disharmonizer and the knowledge roles occurred the least.

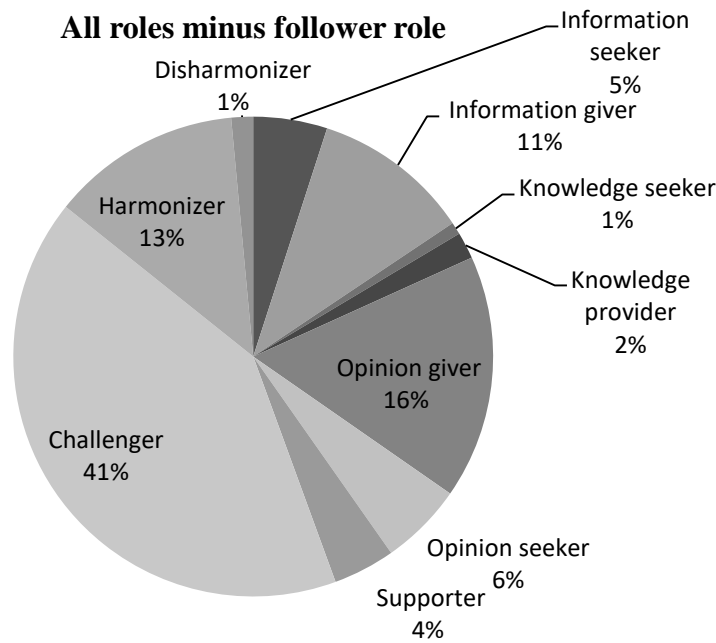


Figure 3. All perceived roles in percentages of all participants without the follower role.

Research question 3: How do roles and interaction types interact with each other in a workplace context?

A Chi-square test of independence was calculated comparing the frequencies in seconds of interaction types with different roles. A significant relation was found, $\chi^2(30) = 23707.01$, $p < .001$. The Bonferroni correction was not needed because $p = .000$. Table 3 shows the relation percentages calculated by the Chi-square test. When reviewing this table and the interaction type *accepted*, it is notable that most common roles within interaction are the follower (67%) and the supporter (14%). The most noticeable about *engaged* interaction was that it seems to be related most with the challenger (44%) and the opinion giver (17%). Next to this, it is important to point out that the percentages within roles are high for almost every role. The percentages of the disharmonizer, the follower and the supporter roles are relatively low compared to the rest of the roles. On the other hand, the knowledge provider (96%) and the knowledge seeker (100%) are almost exclusively seen when somebody is engaged. Next, the interaction type *ignored* showed the highest relation with the roles

disharmonizer (51%) and harmonizer (20%). Lastly, the roles challenger (37%) and opinion giver (21%) had the highest relation with the interaction type *initiated*.

Figure 4 shows the differences of roles and interaction per observed team and how they differ from each other. Team A had the most occurrences of the information giver role (84%) and the least of the knowledge seeker role (5%). In this team, every team member got an equal chance to give their feedback to the team. The team agreed with each other most of the time, and team members added information to another team members feedback, rather than seeking knowledge or discussing it. An example would be;

A: *"I sometimes miss that I don't know if the clients are happy or not with our work."*

B: *"Yes."* c; *"Indeed, you don't hear anything about that."* d; *"If you don't hear anything, most of the time that's positive."*

D:; *"That's true, yes, we don't hear much about it."*

B: *"How can we solve this?"*

A: *"That's a hard question, more information from the support team? Maybe once a week, we plan something with them?"*

D: *"Yes indeed."*

- (all team members agree)

Next, when looking at team B, it is clearly visible (figure 4) that this is the team with the highest percentage of the interaction *ignored* compared with the other teams (75%). Team B has also the highest percentage of the role disharmonizer (90%), and the lowest percentage of the supporter role (12%). The knowledge provider and knowledge seeker role did also barely occur in this team. An example of the communication in team B is;

A: *"The thing that you have to ask yourselves is what went well and what should we keep doing next time."*

B: *"Cake."*

C: *"That's not work related."*

D: *"But you may say everything, everything!"*

A: *"(funny voice) person b is a nice guy."*

B: *"If somebody would say that, I expect it to be very cynical."*

C: *"Velocity was okay, despite.."*

B: *(Laughs very hard).*

- (Silence in the group).

D: *"We have an hour for this right?"*

E: “Less would be nice”.

- (Everybody laughs and conversation topic shifts to how bad the pens are).

Team C seems relatively low in opinion seeker (19%) or opinion giver roles (18%), but the harmonizer (50%) and knowledge provider (58%) roles occurred more (see figure 4). In this team, the scrum master talked a lot, gave a lot of information and complimented the team often. The role *disharmonizer* was not seen in this team.

Table 3

Cross table interaction types and roles.

			Roles											Total
			CH	DH	FO	HA	IG	IS	KP	KS	OG	OS	SU	
Interaction	accepted	% within interaction	3.6%	0.9%	65.5%	8.0%	1.6%	2.0%	0.0%	0.0%	3.5%	1.1%	14%	100%
		% within roles	1.7%	12.9%	77.2%	12.8%	2.8%	7.3%	0.0%	0.0%	3.8%	3.9%	65%	16.4%
	engaged	% within interaction	43.6%	0.4%	3.7%	9.1%	11.3%	5.9%	2.2%	1.2%	16.6%	4.4%	1.7%	100%
		% within roles	84.6%	22.3%	18.4%	61.4%	84.6%	89.2%	96%	100%	76.6%	67%	34%	69.1%
	ignored	% within interaction	0.3%	51.1%	12.5%	20.1%	0.8%	0.0%	0.0%	0.0%	14.8%	0.5%	0.0%	100%
		% within roles	0.0%	64.8%	1.3%	2.9%	0.1%	0.0%	0.0%	0.0%	1.5%	0.2%	0.0%	1.5%
	initiated	% within interaction	37.2%	0.0%	3.3%	17.8%	8.7%	1.2%	0.4%	0.0%	20.8%	10%	0.3%	100%
		% within roles	13.7%	0.0%	3.1%	22.9%	12.4%	3.5%	3.7%	0.0%	18.1%	29%	1.0%	13.1%
Total		% within interaction	35.5%	1.2%	13.9%	10.2%	9.2%	4.6%	1.5%	0.8%	15.0%	4.6%	3.5%	100%

Roles and interaction types per team

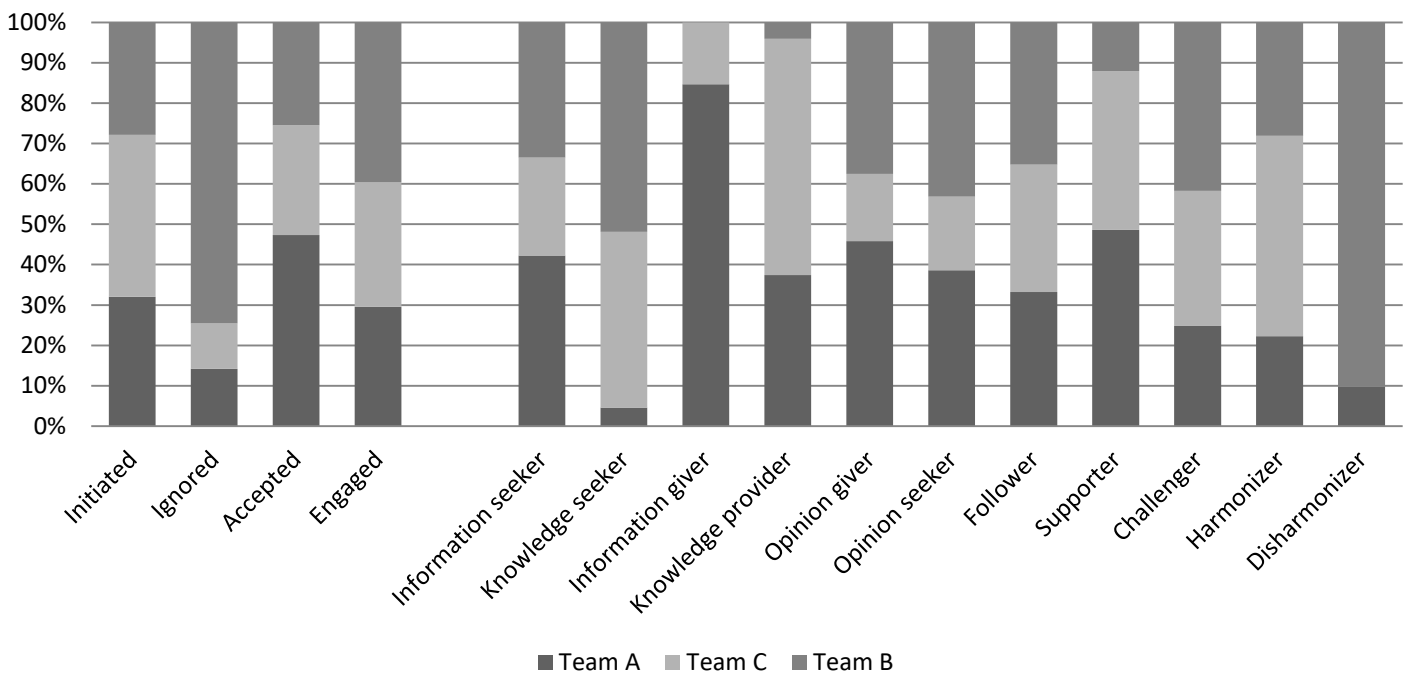


Figure 4. Percentages of the roles and interaction types of all the teams

Discussion

In this study, we have looked at the concept of regulatory roles and different regulatory interaction types in the workplace setting. Research about these topics is scarce for the workplace setting, so this study was quite explorative.

The first research question was what types of interaction we would see in a working context. The engaged interaction type was perceived the most (69%), initiated (13%) and accepted (16%) interaction were perceived far less and the interaction type ignored almost did not occur (2%) (figure 1). This does not mean that this interaction type is not important, because Totterdell et al. (2012) stated that when co-workers witness unpleasant interaction between other co-workers, they experience negative emotions. This could have the effect of creating a negative climate in a team (Barsade, 2002), which consequently negatively affects team cohesion and team performance (de Jong, Curşeu & Leenders, 2014). Next to this, Molenaar (2011) also found that the *ignored* interaction type had a negative impact on teams. Therefore, even with the low occurrence of the *ignored* interaction type, it might still have a big negative impact on the team spirit.

Differences between teams were also found. Team B had a lot of occurrences of ignored interaction in comparison with the other teams. This team also had a lot of occurrences of the disharmonizer role, and the least occurrences of the supporter, harmonizer and the knowledge provider roles. Next to that, some team members of team B stated in the retrospective meetings that they did not liked the communication within the team (*a: "I do not like the way we communicate within the team." b: "It is not like I like it, I do not like it either."*). In brief, it seemed that ignored interaction indeed has a negative impact on team B. According to Molenaar (2011), ideally, ignored interaction would not occur in teams, whereas engaged interaction ideally would occur the most. Accepted interaction is also important, but too much accepted interaction could have the effect of not bring enough new ideas to the table. When accepting, team members mostly adopted the follower role. They confirmed the line of reasoning from other team member(s) and this could be at the expense of other types of interaction like engaging or initiating. In these interaction types there is more room for new ideas, criticism or questions and this will add new information to the conversation, whereas the accepted interaction does not do that. The interaction *initiated* and *ignored* were observed twice as often as in the study of Wijga and Endedijk (2017). A possible explanation for this could be the fact that this study only looked at the retrospective team meetings, whereas Wijga and Endedijk (2017) did look at all the different meetings of

the scrum method. In the retrospectives, feedback is asked and given by every team member and the scrum master encourages the team members to do so. The goal is to talk about what went well and what could be done differently, and if possible, find solutions for problems. Team members initiate more in these meetings, because they all have to initiate giving feedback. Because of this, the interaction *initiated* could be observed more than in the study of Wijga and Endedijk (2017). An explanation for the higher occurrence of the interaction *ignored* could be that 75% of the found ignoring communication occurred in one team. Maybe this team was an exception on all the other teams in the data. Next to that, it should be mentioned that there could be more instances of ignored interactions than we were able to uncover with the current coding scheme, because sometimes team members implicitly ignored another team members' regulatory activity. Team members would for example initiate a new cognitive activity, and by that, ignore another team members' activity. This was then coded as *initiated* instead of *ignored*. A solution for this problem would be to adapt the description of the code *ignored* by adding that initiating while ignoring another regulatory activity, is coded as ignored. Therefore, these ignored activities will not stay hidden anymore. Nevertheless, the findings in this study confirm that these interaction types are suitable for the workplace context.

The second research question was to what extent play individuals different regulatory roles in teams at the workplace. To answer this question, the already existing coding scheme of Volet et al. (2017) was adapted to fit the workplace setting and the data was coded again. Adaptations were made to the description of the harmonizer role. Benne and Sheats (1948) suggested that there are a harmonizer and a compromiser role, which taken together, come down to the adaptation made to the harmonizer role in the coding scheme used in this study (appendix A). Volet et al. (2017) did not have a negative impact role in their coding scheme. In their study it might never have occurred that a team member took on a role that was mainly dysfunctional for the team. Benne and Sheats (1948) did have some negative roles like the aggressor, the blocker or the playboy, but the descriptions of these roles were too specific for the new coding scheme. This study took all those negative roles together, adapted them with the knowledge gained from the observations, and formed a completely new role, namely the disharmonizer. The new codes proved to be significantly different from the other codes and therefore the new coding scheme is suitable for the workplace setting. Furthermore, individuals were often very flexible in taking on different roles. This finding is in line with the idea that roles are very situational, contextual and flexible (Stewart et al., 2005; Chiu,

2000; Benne & Sheats, 1948). Nevertheless, a theoretical underpinned empirically-informed coding scheme could be reliable for categorizing roles, but it will possibly not be universally suitable for every setting. This is shown in this study, because the coding scheme of Volet et al. (2007) was not entirely suitable for the workplace setting while it was for the academic setting.

The follower role was by far the most observed role (62%). This was because the description of this role suits when people are listening, nodding or are indifferent with what is talked about in the team. An example of a situation where the follower role would occur a lot is when two team members are in a discussion about a topic which only concerns them while all the other team members are listening. Every team member at any given time was coded with a role. Most of the time two or three people were talking and the rest listened, so that is a reason why this role occurs so often. It has to be said that it can be possible that team members were coded as a follower, but were really not paying attention to the conversation and thinking about something else, even though it seemed like they did pay attention. This is the downside of the description of the follower role, because it does not enable to make a distinction between listening while being interested and listening but being indifferent. Future research could improve this by adding a role that is suitable for when people are indifferent. It will be challenging to measure or observe whether people are indifferent or not. A suggestion for future research would be to look at episodes. An episode will start when a topic is initiated and lasts till a new topic is initiated. When a team member does not add anything to the conversation verbally in one episode, he should be coded as an indifferent follower opposed to an interested follower. Furthermore, it is important to question if the high occurrence of the follower role is beneficial or dysfunctional for the team. The follower role was almost equally as often visible per team, so it is hard to say what the effect would be when the follower role occurs less or more. When looking at the goal of a retrospective meeting, it would not be beneficial when the follower role occurs too often. Discussion and engagement are important, and too much of the follower role would not stimulate that. On the other hand, taking on the follower role is important to give other team members the space to give for example feedback. In brief, the retrospectives could be more effective when there is a good balance of the follower role with other roles.

Certain roles seem to play a bigger role in the retrospective team meetings than others when looking at the percentages of occurrence. The knowledge seeker, provider and the disharmonizer all occurred 2% or less. An explanation for low occurrence of the knowledge

seeker and provider roles is that only retrospective meetings were observed. Very little knowledge was asked or shared during these evaluation meetings which is not very surprising considering the goal of the meeting. The disharmonizer occurred very little because most team members seem to want the best for the team and tried to be as reasonable as possible. This does not mean that the disharmonizer role is not important, because even though the low occurrence, this role could have a big impact on the teams. As said earlier, unpleasant interactions between co-workers can create a negative climate in a team, which has a negative effect on team cohesion and performance (Totterdell et al., 2012; Barsade, 2002; de Jong, Curşeu & Leenders, 2014). In addition, negative behaviours in a team could cause team members to for example withhold important information, have problems with mood maintenance or sabotage, so the disharmonizer role could have a big impact on a team (Chiaburu & Harrison, 2008; Felps, Mitchell, & Byington, 2006; Lyons & Scott, 2012). Ideally, the roles knowledge seeker, knowledge provider, opinion giver, opinion seeker and challenger should occur often and in balance in retrospective meetings. These roles stimulate discussion and problem solving the most, which is the goal of retrospective meetings (Volet et al. 2017).

The third research question was how roles and interaction types interact with each other in a workplace context. The results showed that there was a significant relation between interaction types and roles. Volet et al (2017) found that for high performing groups with socially shared regulation, the roles knowledge seeker, knowledge provider, and supporter were more present. The challenger role was also observed often, but also in lower performing groups. Next to this, accepted and engaged interaction is likely to benefit the quality of social regulation in a team (Molenaar, 2011). When combining the results of these two studies, it is expected that these high performing roles have a high relation to these two interaction types. This seems in accordance with the results found in the current research, which showed us that for example 65% of the occurrences of the supporter role were found while the interaction type *accepted* occurred (table 3). It is interesting to see that the supporter role occurred the most in team A and C while team B had a very low occurrence of this role. Considering the fact that team B also had a lot of ignored interaction and occurrence of the disharmonizer role, team B seemed to have a low quality of social regulation. In the team with a higher quality of social regulation, the role of supporter was indeed more present. When combining these findings with the findings of Molenaar (2011), these roles of high performing groups should occur more when people accept or engage. The team (B) who showed the interaction

accepted the least, also had the least occurrence of the supporter role. They also initiated the least, which means that new topics were less often introduced compared to the other two teams. Next to that, team B had almost no occurrences of the information giver and knowledge provider roles. Lastly, team A had the highest occurrence of *accepted* interaction and the highest percentage of the supporter role. These findings support that the roles of high performing groups should occur more when people accept or engage (also see table 3).

What is surprising is the fact that the role *harmonizer* was seen at the same time as the interaction type *ignored* (20%). A reason for this could be that somebody ignored a regulatory activity with a joke or a compliment. An example from the observations would be that one team member was seeking an opinion and other team members ignored it and were joking and laughing with each other about a coffee can. This finding has to be considered, since the harmonizer role description tells us that this role tries to have a positive effect on the group. Making jokes while also ignoring another group member might not have a very positive effect, but it still fits the harmonizer description as currently used in this study. This description could be adjusted for future research.

When looking at the differences per team, it is worth mentioning that team B had the highest percentage of ignored interaction and disharmonizer and the lowest of the knowledge provider and seeker and the supporter roles. According to Jordan and MCDaniel (2014), if team members ignore questions and uncertainties, individuals tend to not participate as much and stop addressing uncertainties. This also works in the opposite way. If people are giving attention to uncertainties and questions, it leads to a more productive and positive outcome for the team. Teams A and C did give more attention to uncertainties and questions and did not nearly ignore as often as team B did. When a team or a person tends to ignore the regulatory activities from others, this might have a negative impact on the teams' interaction types and their willingness to adopt certain roles.

Limitations and recommendations

Research about regulatory roles at the workplace is scarce. This study tries to provide more insight in roles and regulatory interaction in the workplace setting. Only three teams with all two retrospective meetings were observed. To draw reliable conclusions, more teams and more different meetings should be observed. It is also important to note that these teams all were in the ICT-sector, so the information gained cannot be generalised to sectors that have a different method than an agile management method. Next to this, the data was coded by one researcher and partially checked by another. The data would be more valid if totally coded by

two or more researchers so that a reliability analysis could be conducted. Another limitation is that this study did not measure any outcomes of the teams' work. Therefore it is hard to say if a team performed well or not. Information is gained about how regulatory roles relate to regulatory interaction types, but not how that affects the team performance. It is recommended for future research to look into this. Nevertheless, this study was able to look at the quality of the communication in the teams, which is also a part of how they perform. As a final recommendation, it would be interesting to look into personality and role adoption. If it is possible to find correlation between personality and role adoption, it could be used for putting together an efficient and pleasant team.

Conclusion

Based on the findings of this research, it can be concluded that the codes for the interaction types and the adapted codes for the different regulatory roles are suitable for the workplace context. Engaged and accepted interaction were beneficial while ignored interaction was never beneficial for the quality of social regulation within a team. Team members took on different roles and these roles influenced the quality of social regulation. We concluded that the balance between the roles determines the quality of social regulation. However, the disharmonizer role was never beneficial. In this study we only looked at retrospective meetings. Other types of meetings could require a different balance of the different roles. Furthermore, there was a significant relation found between the different regulatory roles and the regulatory interaction types. The roles of knowledge seeker, knowledge provider, and supporter occurred more when team members were engaging or accepting. Therefore we can say that these roles are important for a high quality of social regulation within a team. Next to this, the role of the disharmonizer occurred almost always at the same time as ignored interaction. It is worth mentioning that more research is needed with a bigger sample make more valid conclusions. Even though this study is just a little step in the right direction, it was important for exploring the mainly unknown relation between regulatory roles and regulatory interaction types.

References

- Barsade, S. G. (2002). The ripple effect: Emotional contagion and its influence on group behavior. *Administrative Science Quarterly*, 47, 644–675. doi:10.2307/3094912
- Benne, K.D., & Sheats, P. (1948) Functional roles of group members. *Journal of Social Issues*,4(2), 41-49. doi: 10.1111/j.1540-4560.1948.tb01783.x
- Chiaburu, D. S., & Harrison, D. A. (2008). Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance. *Journal of Applied Psychology*, 93, 1082–1103. doi:10.1037/0021-9010.93.5.1082
- Chiu, M. M. (2000). Group problem-solving processes: Social interactions and individual actions. *Journal for the Theory of Social Behaviour*, 30(1), 26–49. doi: 10.1111/1468-5914.00118
- Felps, W., Mitchell, T. R., & Byington, E. (2006). How, when, and why bad apples spoil the barrel: Negative group members and dysfunctional groups. *Research in Organizational Behavior*, 27, 175–222. doi: 10.1016/S0191-3085(06)27005-9
- Hadwin, A. F., Jarvela, S., & Miller, M. (2011). Self-regulated, co-regulated, and socially shared regulation of learning. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 65–84). New York, NY: Routledge.
- de Jong, J. P., Curşeu, P. L., & Leenders, R. T.. A. J. (2014). When Do Bad Apples Not Spoil the Barrel? Negative Relationships in Teams, Team Performance, and Buffering Mechanisms. *Journal of Applied Psychology*. Advance online publication. doi: <http://dx.doi.org/10.1037/a0036284>
- Jordan, M. E., & McDaniel, R. (2014). Managing uncertainty during collaborative problem solving in elementary school teams: The role of peer influence in robotics engineering activity. *Journal of the Learning Sciences*, 23(4), 490–536. doi: 10.1080/10508406.2014.896254.
- Lyons, B. J., & Scott, B. A. (2012). Integrating social exchange and affective explanations for the receipt of help and harm: A social network approach. *Organizational Behavior and Human Decision Processes*, 117, 66–79. doi:10.1016/j.obhdp.2011.10.002
- Lord, R. G., Diefendorff, J. M., Schmidt, A. M., & Hall, R. J. (2010). Self-regulation at work. *Annu Rev Psychol*, 61, 543-568. doi:10.1146/annurev.psych.093008.100314

- Moe, N. B., Dingsøyr, T., & Dybå, T. (2010). A teamwork model for understanding an agile team: A case study of a Scrum project. *Information and Software Technology, 52*(5), 80-491. doi:http://dx.doi.org/10.1016/j.infsof.2009.11.004
- Moe, N. B., Dingsøyr, T., & Dyba, T. (2008). *Understanding self-organizing teams in agile software development*. Paper presented at the Software Engineering, 2008. ASWEC 2008. 19th Australian Conference on.
- Molenaar, I. (2011). *It's all about metacognitive activities: computerized scaffolding of self-regulated learning*
- Newell A. (1990). *Unified Theories of Cognition*. Cambridge, MA: Harvard Univ. Press
- Rogat, T. K., & Linnenbrink-Garcia, L. (2011). Socially Shared Regulation in Collaborative Groups: An Analysis of the Interplay Between Quality of Social Regulation and Group Processes. *Cognition and Instruction, 29*(4), 375-415. doi:10.1080/07370008.2011.607930
- Schmidt, A.M., & DeShon, R.P. (2007). What to do? The effects of discrepancies, incentives, and time on dynamic. *Journal of Applied Psychology, 92, No. 4, 928–941*. doi: 10.1037/0021-9010.92.4.928
- Schoor, C., Narciss, S., & Körndle, H. (2015). Regulation During Cooperative and Collaborative Learning: A Theory-Based Review of Terms and Concepts. *Educational Psychologist, 50*(2), 97- 119. doi:10.1080/00461520.2015.1038540
- Sitzmann, T., & Ely, K. (2011). A meta-analysis of self-regulated learning in work-related training and educational attainment: What we know and where we need to go. *Psychological Bulletin, 137*(3), 421-442. doi:10.1037/a0022777
- Stewart, G. L., Fulmer, I. S., & Barrick, M. R. (2005). An exploration of member roles as a multilevel linking mechanism for individual traits and team outcomes. *Personnel Psychology, 58*(2), 343–365. doi: 10.1111/j.1744-6570.2005.00480.x
- Totterdell, P., Hershcovis, M. S., Niven, K., Reich, T. C., & Stride, C. (2012). Can employees be emotionally drained by witnessing unpleasant interactions between coworkers? A diary study of induced emotion regulation. *Work & Stress: An International Journal of Work, Health & Organisations, 26*, 112–129. doi:10.1080/02678373.2012.681153
- Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review, 3*(2), 130- 154. doi:10.1016/j.edurev.2007.12.001
- Vauras, M., Iiskala, T., Kajamies, A., Kinnunen, R., & Lehtinen, E. (2003). Shared regulation and motivation of collaborating peers: a case analysis. *PSYCHOLOGIA, 46*(1), 19-37.

doi:10.2117/psysoc.2003.19

- Volet, S., Vauras, M., Salonen, A., & Khosa, D. (2017). Individual contributions in student-led collaborative learning: Insights from two analytical approaches to explain the quality of group outcome. *Learning and Individual Differences* 53, 79–92. doi: <http://dx.doi.org/10.1016/j.lindif.2016.11.006>
- Volet, S., Summers, M., & Thurman, J. (2009). High-level co-regulation in collaborative learning: How does it emerge and how is it sustained? *Learning and Instruction*, 19(2), 128-143. doi:10.1016/j.learninstruc.2008.03.001
- Wijga & Endedijk (2017) Social regulation at the Workplace: the Development of an Analysis Tool. EARLI 2017 conference, Tampere, Finland, August 29th – September 2nd 2017.
- Winne, P. H., & Hadwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in educational theory and practice* (pp. 277–304). Mahwah, NJ: Erlbaum.

Appendix A:

Adapted code scheme for individual roles at the workplace

Codes	Description
Roles (see Volet et al. (2017, p. 84) and Benne & Sheats (1948))	
Information seeker (IS)	“IS seeks for facts and information related to content, without a critical approach. If a person is trying to get a deeper understanding of content, or asks for interrelations or cause and effect it is coded as ‘KS’”.
Information giver (IG)	“IG offers facts and information related to content without a critical approach, elaboration or scientific explanations. IG may also provide information in question form, when seeking for confirmation”.
Knowledge seeker (KS)	“KS is interested in receiving deeper knowledge to understand issues related to the content, without being critical to previous comments. KS may also initiate something new by bringing up a question related to possible solutions. KS is interested in cause and effect and interrelations”.
Knowledge provider (KP)	“KP offers elaborated information and scientific explanations, without a critical or challenging approach. KP may shape the statements of others by introducing how they would work out if adopted by the group. KP may also express causal relations, provide new solutions related to content and thereby initiate something new”.
Opinion seeker (OS)	“OS invites others to express their opinion in something dominantly related to procedures. OS is not interested in getting facts or knowledge. OS may want to know, for example, which alternative should be chosen or how the team should proceed or initiate a new procedural approach”.
Opinion giver (OG)	“OG expresses an opinion that is dominantly related to procedures, for example, by telling which solution, alternative or approach the group should choose. OG does not offer information or facts. OG does not challenge someone else's opinion or criticizes, like challenger does”.
Follower (FO)	“FO either agrees or is indifferent with the suggestions made/information provided. FO may agree verbally or just nod, or may state that they do not know or that they are ready to go along the group”.
Supporter (SU)	“SU repeats suggestions or ideas with added clarity. SU does not elaborate, questions nor disagrees but states

Challenger (CH)	<p>previous comments in other words, thus clearly supporting them. SU presents supportive additions or proposals, e.g. a statement or question, when looking for a confirmation”.</p> <p>“CH puts previous comments to the test by asking for clarification or disagreeing with ideas and suggestions, showing interest in exploring alternatives. CH may volunteer counter proposals that invite others to evaluate his/her criticism, or invite others to evaluate suggestions, which promotes the consideration, critique and possible rejection of multiple possibilities. CH may challenge content related or procedural matters”.</p>
Harmonizer (HA)	<p>“HA tries to have a positive effect on the group atmosphere. HA may praise the group or a member for good work, may try to resolve conflicts, sometimes using humor and telling jokes, or by being vulnerable and admitting his/her errors”.</p>
Disharmonizer (DH)	<p>“DH has a negative effect on the group atmosphere. DH may make offensive or cynical comments or jokes that have a negative effect on the group. DH may complain and challenge ideas without being open for solutions or suggestions, or straight out ignore comments”</p>
