

Grounded Theory on Regulative Strategies used in Cooperative Learning by primary school children.

S. J. Pierik (s0182397)

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Primary Supervisor: Dr. A. H. Gijlers

Secondary Supervisor: Dr. A. M. van Dijk

Department of Instructional Technology

Faculty of Behavioural, Management and Social Sciences

University of Twente, Enschede

The Netherlands

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Abstract

Learning does not happen in a vacuum. Learning often happens in a social setting, especially considering that cooperative learning is an important part of primary education. Additionally, self-regulation is an important aspect of understanding learners. An individual learner will need to maintain motivation and focus, and often needs to make use of strategy and planning. Additionally, In recent years, with the introduction of Socially Shared Regulation of Learning, theory on self-regulation has expanded from the individual to the social. Theory on cooperative learning and Socially Shared Regulation of Learning are related and each has something to offer to the other. In this study, using a grounded theory approach, we have analysed four small groups of sixth grade children working on an unstructured group assignment. Results are presented using excerpts from the transcripts, giving insight in the processes involved in self-regulation and shared regulation of learning in a cooperative setting. A model is proposed from a developmental perspective, centred around stimulating learning of self-regulation skills and collaboration skills.

Introduction

Cooperative learning is a prominent feature of many educational practices, not the least in primary education. Whether it is popular for practical reasons or because teachers believe in the effectiveness of the method, research confirms cooperative learning has a variety of positive effects on learning outcomes. A meta-analysis by Kyndt et al. (2013) has shown that cooperative learning is positively related to achievement and attitude. And also that, although it is effective for all age groups, it is especially effective in the second half of primary school.

Slavin (2015) identifies four complementary theoretical perspectives through which researchers have provided possible explanations for the positive influence of a cooperative setting on learning. Slavin writes that "cooperative learning refers to teaching methods in which students work together in small groups to help each other learn academic content." One starting point for explanations is the idea that, in a cooperative setting, it is in the interest of all group members that each member performs well. This could change social norms among peers so that peers will encourage each other and increase motivation. A second perspective involving motivation is that learners enjoy working together, as well as helping each other. The third perspective uses principles from developmental psychology; most notably the idea that peers are likely to operate within each other's zone of proximal development and can therefore be a model for each other. And finally, the perspective that relies on the concept of cognitive elaboration offers the explanation that a social setting, which involves communication, stimulates learners to restructure information.

Naturally, describing the process of cooperative learning is not limited to the four perspectives mentioned above. An individual learner will have to maintain motivation and focus, make plans, monitor and evaluate progress, and manage their emotions. This is called self-regulation. And group members might help their peers with these processes.

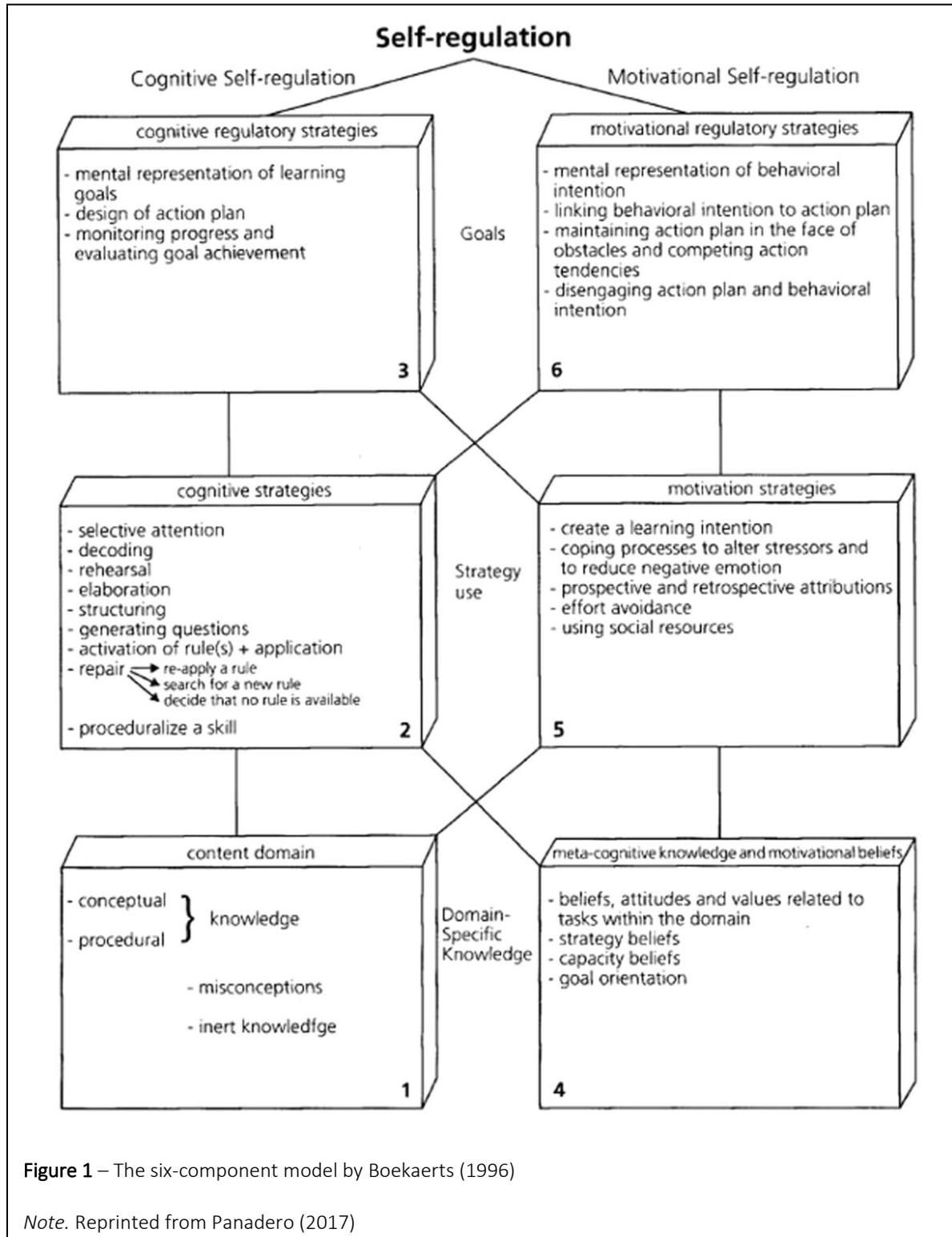
This is called co-regulation. But the group also has to manage itself at a group level. This has been called Socially Shared Regulation of Learning (Hadwin, Järvelä, & Miller, 2011; Hadwin & Oshige, 2011). So self-regulation and cooperative learning are related. And this goes two ways. Socially shared regulation and self-regulation of learning is always part of cooperative learning. But in accordance with the theoretical perspectives described above, cooperative learning can also potentially improve self-regulation.

Self-Regulation of Learning (SRL)

The concept of self-regulated learning (SRL) emerged from research done in the 1970s and 1980s on various self-regulating processes. A symposium, held in 1986, sought to integrate research on the various elements of self-regulation, and SRL was defined as students being 'metacognitively, motivationally, and behaviourally active participants in their own learning process' (Zimmerman, 2008). These three aspects give some insight into what is involved in the SRL, and how SRL is a very encompassing umbrella concept. Furthermore, metacognition and motivation are encompassing concepts themselves that are defined and delineated in different ways. And naturally, a lot of research has been done on SRL since 1986 and various models have been proposed that have differing underlying structures.

Panadero (2017) has reviewed the SRL literature and highlighted and reviewed six models. Five of them involve only self-regulation, and the sixth is the model of Socially Shared Regulation of Learning by Hadwin et al. (2011). In these models, behaviour does not seem to have the same status as metacognition and motivation, and emotion is an important factor in most models. In his review Panadero (2017) emphasized that although empirical evidence has been found for many of the models, research is difficult due to the comprehensiveness of the models, and a lot of research is still needed.

It would be too much to discuss all six models here, but two of the SRL-models are shown here as an illustration. We will also elaborate upon the model for Socially Shared Regulation of Learning (Hadwin et al., 2011).



The model by Boekaerts has two parts. The first part is called the six-component model (Boekaerts, 1996; figure 1) and it contains many operational-level elements that make up the process of self-regulation, divided along different lines. Vertically distributed among the three categories. On the bottom the elements that are part of domain-specific knowledge, in the middle the strategic skills

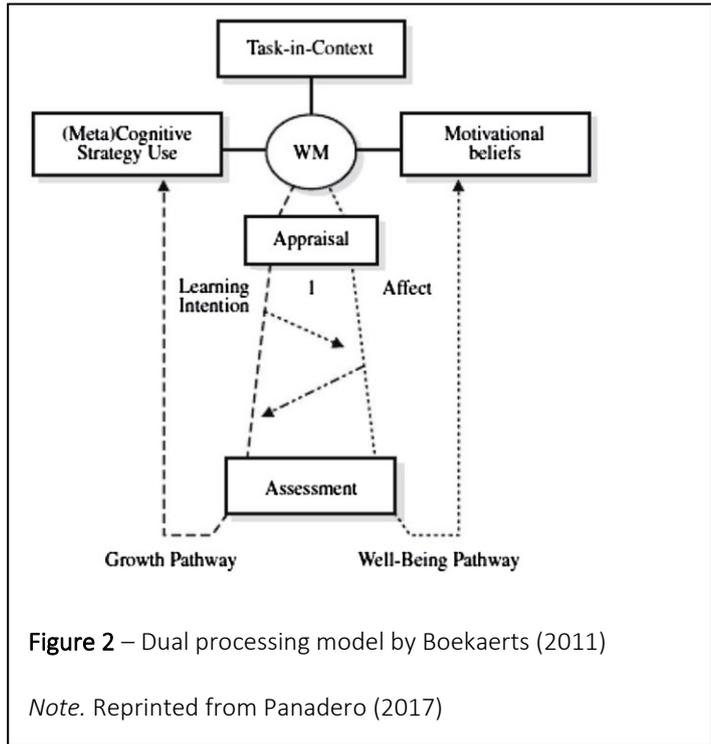


Figure 2 – Dual processing model by Boekaerts (2011)

Note. Reprinted from Panadero (2017)

or techniques, and on top the goal-oriented strategies. And horizontally it is divided between cognitive regulation and motivational regulation. The second part (the dual processing model; Boekaerts, 2011; figure 2) has the same cognitive-motivational duality. This more dynamic part presents pathways of processes and shows a top-down and a bottom-up movement.

TABLE 1 Phases and Areas for Self-Regulated Learning

Phases	Areas for regulation			
	Cognition	Motivation/affect	Behavior	Context
1. Forethought, planning, and activation	Target goal setting	Goal orientation adoption	[Time and effort planning]	[Perceptions of task]
	Prior content knowledge activation	Efficacy judgments	[Planning for self-observations of behavior]	[Perceptions of context]
	Metacognitive knowledge activation	Ease of learning judgements (EOLs); perceptions of task difficulty		
2. Monitoring	Metacognitive awareness and monitoring of cognition (FOKs, JOLs)	Task value activation	Awareness and monitoring of effort, time use, need for help	Monitoring changing task and context conditions
		Interest activation		
3. Control	Selection and adaptation of cognitive strategies for learning, thinking	Awareness and monitoring of motivation and affect	Self-observation of behavior	Change or renegotiate task
		Selection and adaptation of strategies for managing motivation and affect	Increase/decrease effort	Change or leave context
4. Reaction and reflection	Cognitive judgments	Affective reactions	Persist, give up	Evaluation of task
		Attributions	Help-seeking behavior	Evaluation of context
		Attributions	Choice behavior	

Figure 2 – SRL model by Pintrich (2000)

Note. Reprinted from Panadero (2017)

The model by Pintrich (2000), shown in figure 3, is strikingly different. It does have motivation and

cognition as its main components, but it also includes behaviour, as well as context. Furthermore, it is structured differently on the vertical axis. It is not dynamic, though the addition of phases provide a temporal sequence.

Socially Shared Regulation of Learning

Whereas SRL is a term referring to processes within an individual, researcher have studied its relation to the social context. Hadwin & Oshige (2011) have reviewed the research, existing at the time, on SRL in a social context and summarized the research methods used (see Table 1). They distinguished between self-regulation, coregulation and socially shared regulation. In co-regulation of learning, parts of the self-regulation process of the learner are taken over or supported by someone else, typically a teacher or a peer. It occurs between two people and is asymmetrical. Socially shared regulation of learning on the other hand, is when "multiple others regulate their collective activity" (Hadwin & Oshige, 2011).

Hadwin et al. (2011) and Järvelä & Hadwin (2013) have proposed a model of Socially Shared Regulation of Learning (SSRL). Their model is represented in figure 4. It shows three modes of regulation that are part of collaborative settings, i.e. SRL, co-regulation and SSRL. It also shows an outer ring of phases and an inner ring of processes involved. Their model is one of the six models in the previously mentioned review by Panadero (2017), but it is reviewed in more detail by Panadero & Järvelä (2015). Panadero & Järvelä propose four general areas in which to refine the model. First is the influence of individual characteristics on the group process; secondly, the influence of the type of task on the successful use of SSRL; thirdly, developmental aspects; and finally, the model needs more conceptual clarity. In his 2017 review, Panadero discusses the latest developments, and the model has been conceptually reshaped, but the other recommendations remain undiscussed.

	Self-regulated learning	Coregulated learning	Socially shared regulation
Definition	The process of becoming a strategic learner by actively monitoring and regulating metacognitive, motivational, and behavioural aspects of one's own learning.	Transitional processes in a learner's acquisition of SRL, during which members of a community share a common problem-solving plane, and SRL is gradually appropriated in response to and directed toward social and cultural contexts.	Processes by which multiple others regulate their collective activity. From this perspective, goals and standards are coconstructed, and the desired product is socially shared cognition.
Focus of data collected and analyzed	Individual focus on dependent variables -performance -motivation -strategies and skills -metacognitive awareness -self-reported behavior Social focus on instructional context and sometimes manipulated as independent variable	Discourse or dynamic interaction Interplay among individual, classroom, parental, and cultural influences	Discourse and dynamic exchange Individual roles and contributions but always in the context of others Evolution of idea units and regulatory activities
Data collected	Self-reports Performance measures Mental models Interview data Observations Think-aloud protocols	Discourse Frequency and content of interactions Observations of shared behaviors and sociocultural dynamics	Discourse Observed interaction (verbal and nonverbal) Individual roles and contributions to group Group products
Analytical techniques	Correlation of individual factors/measures Content analysis Comparative methods (e.g., case study, ANOVA, etc.)	Discourse analysis Content analysis Correlational analyses Class-level factors/measures	Discourse analysis Network analysis

Table 1. Comparison of Different Perspectives of Social and Self-Regulated Learning
Note: Reprinted from Hadwin & Oshige (2011)

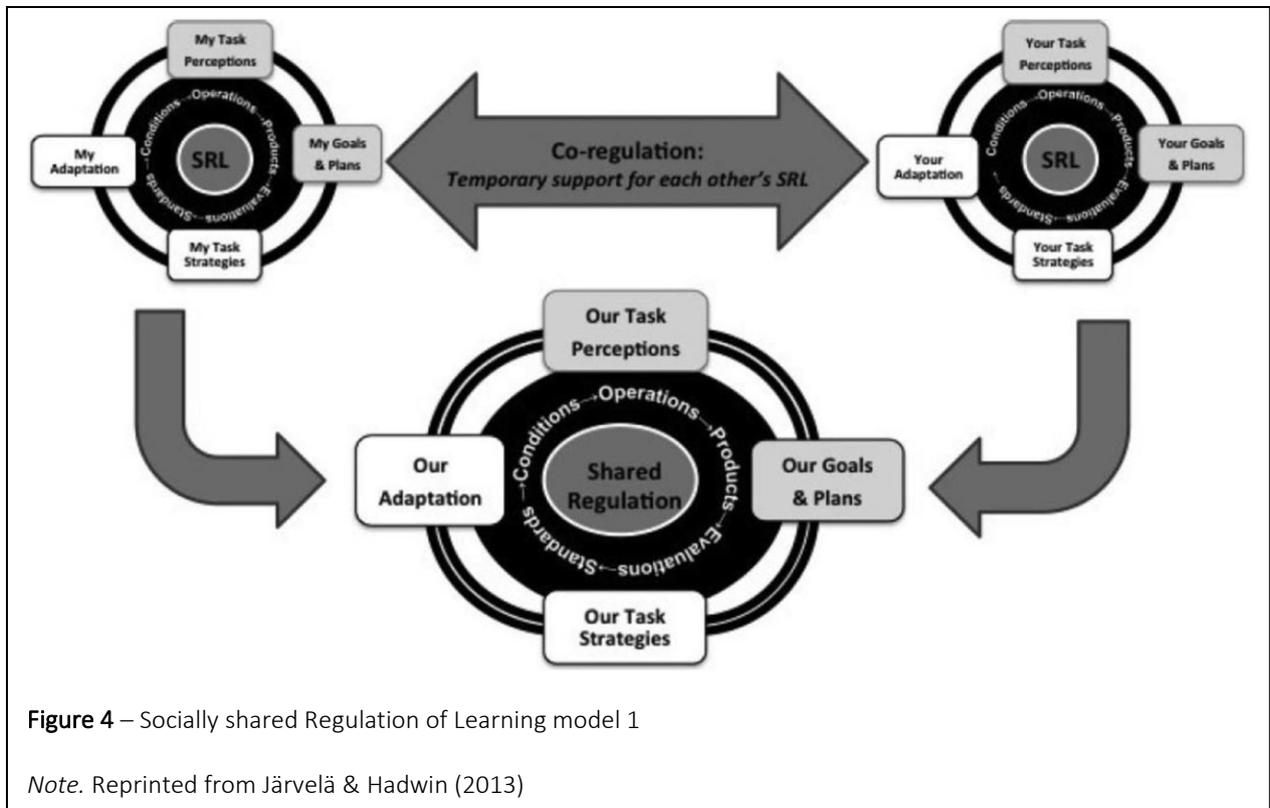


Figure 4 – Socially shared Regulation of Learning model 1

Note. Reprinted from Järvelä & Hadwin (2013)

This study

The majority of the models of models for socially shared regulation is based on studies in secondary and higher education. Models of SRL and SSRL are very comprehensive and attempt to describe a very complex phenomenon. Because of this, the models can be quite abstract. However, especially earlier in development, reality can be very chaotic. A potential risk would be that the clean models are hard to put in practice. Even more so because in primary education, where children are earlier in their development and can struggle with self-regulation.

This study will look at the cooperative learning process of primary school children to explore their regulation strategies. Students will work on a cooperative design task, but will not receive any instruction on regarding the cooperative process or the regulation of the activity. This makes sure that the study will also focus on the regulation strategies that primary school students have available without formal training in these skills. In doing so, it will give insight in what is the starting point for exploring this age group, and what would be the best way to help them reach the next level.

The central question will be: in what way, successful and unsuccessful, do primary school children regulate themselves and each other in a cooperative assignment?

The study uses the grounded theory approach, a widely accepted method for conducting exploratory research (Glaser & Strauss, 1967; Urquhart, 2013). The aim of the method is to explore the data and uncover themes (or patterns) and use these to create a model or theory that is grounded in the actual experiences of the participants. Because of this emphasis on staying close to practical reality, it is suitable for our purposes. The models or themes generated by using this approach contribute to the field by offering a perspective that is aligned with practical reality.

Method

The grounded theory method is an approach used to systematically generate theory. Its basic principle is to generate theory using no prior framework, allowing theory to emerge through rigorous reviewing of rich, contextual data (Glaser & Strauss, 1967). The theoretical foundation and practical application of the grounded theory method can vary considerably, depending how the method is interpreted and which strategies are used (Urquhart, 2013). This section will start with by explaining how the method is viewed from a theoretical perspective in this study, and with what assumptions. Next, we will give a description of the data and how and where it was collected. We will then explain the process of data analysis and theory generation. Lastly, we will discuss ethical considerations.

Methodological framework

The grounded theory method was first described in 1967 by Glaser & Strauss in their book *The Discovery of Grounded Theory*. Whereas most deductive research is built around the exploration, testing and validation of existing theory, the contribution of grounded theory was to set a standard on how theory should be actively generated from data. It is typically open-ended exploratory research and is useful when theory around a certain topic is absent. With this study, this is not quite the case, as we have discussed in the introduction. There is, however, a lack of focus on primary school children in SRL research. Furthermore, the emphasis on grounding also makes the grounded theory method suited to make a positive contribution in a field where top-down theory-driven considerations can lead researchers away from practical reality. Since self-regulation houses a wide array of processes that can be pressed into a mould of many theories, but are hard to untangle in practice, this applies very much to this topic.

Since the book by Glaser and Strauss was published in 1967, different strands of grounded theory have developed (Urquhart, 2013). The two most

prominent variants are associated with both founders, Glaser and Strauss respectively. Where Glaser stressed that theory emerges from data, and the researcher should make sure not to be influenced by extended literature review, Strauss diverges from this strict perspective. On the other hand, Glaser does emphasize the researcher should have theoretical sensitivity, which he would derive from a 'deep and broad knowledge of the literature' This study was done loosely within the 'classic' or Glaserian school of grounded theory. This means there was only a very limited review of literature in the early stage of the research, to prevent top-down generation of theory. Urquhart (2013) was used as the primary reference, as well as the original book by Glaser and Strauss (1967).

Data collection

Sampling of data within grounded theory ideally is an iterative process, with decisions on where to sample new data guided by previous insights (theoretical sampling). For the present study we used an existing dataset of students that worked on a cooperative design task. The data was collected in the context of a larger study on skill development. We focussed on the cooperative learning task that was given to 11-year old students. Due to the limited scope of this study, only one sample was taken. This sample consisted of a random selection of four groups (from a set of 48 groups, all from the same large primary school).

Participants. A total of four groups were analysed, with four participants each, except for one group with three members. Students originated from one large primary school in the Netherlands, and participated with students from their own class. Three groups were mixed gender, and there was one all-boys group. The average age for the children was 11.1 years old. No measures on demographics were taken, but it was noted that parents were relatively highly educated. Students participated in group activities on a regular basis, but received no formal instruction on cooperation and regulation skills.

Material. The cooperative learning tasks, focussed on the design of a garden for the school. The students were informed by the experimenter that the school got the money and permission to create a garden that produced fruit and vegetables. Each student in the group was invited to take the perspective of one stakeholder. This could be one of the neighbours of the school, the school janitor, the director of the school or a spokesman for the rest of the students. Students received a card with the wishes of the stakeholder they had to represent, and were informed that they had to make sure that the wishes of the stakeholder were met in the final design.

Drawing equipment. Student received coloured felt-tip pens (2 sets of 16 felt-tip pens for each group), and a A3 paper to complete their design. Within the groups these materials had to be shared.

Procedure. Children were divided into different groups of four and one of three. Grouping was mostly random, though group members were all from the same class. With respect to group composition the researcher tried to create mixed gender groups and the classroom and groups were adjusted in the event that a personal history of conflict was considered problematic by the teacher. As stated in the participant section our random selection has one all-boys group, and one group consisting of 3 students.

Each group was given the same cooperative assignment, as discussed under materials. The researcher explained to each group what the assignment was, and read the instruction to them. Students worked for 20 minutes on the task. After 15 minutes they received a notification about the fact that they had 5 minutes to complete their design.

Coding procedures and theory generation

This paragraph describes how the emergence of theory through interaction with data was done. Glaser's approach prescribes starting with open coding, i.e. coding with no preconceived coding scheme, into selective codes that start to form a coding scheme (Urquhart, 2013). Initial open

coding was done at a line by line (or even more detailed) level, as advised by Glaser (Urquhart, 2013). This gradually changed into a more episodal level. Due to the richness of the data, the complexity of the processes involved and the chaotic nature of children's communication, line by line coding appeared counterproductive. Also, it appeared problematic to group the still rich episodes, containing various processes, into meaningful code groups, creating selective codes. Instead, the most salient episodal codes were annotated by episode and formed the basis for further theory development. This process can be clearly seen under the results section. Throughout the process, emerging considerations were written down in theoretical memo's and kept.

On a practical level it is important to note that data is referenced by line ([Line number] or [Line number first line]-[Line number last line]). A line number indicates a time interval (of arbitrary length). Therefore, when two or more children make their comments under the same line number, it means they are talking roughly at the same time. The order of appearance within a line is not related to chronological order since it should be considered simultaneous. In some cases the quoted text has been edited slightly by removing irrelevant interjections to improve readability. The more chaotic nature of some of these conversations can be seen in the original transcripts.

Ethical considerations

Ethical concerns regarding proper use of sensitive and/or personal data have been considered. All copies of video material have been kept on secure drives with very limited access and are deleted after they have fulfilled their purpose. Children's names have been changed to ensure anonymity, in the earliest transcript as well as in later data processing. Parents have given active informed consent for the appropriate use of the data.

Results

In this section we will present the findings discussing selected excerpts from the transcripts. This will give the reader context, and will allow us to discuss some of the processes involved within the context. The observed processes will be reflected upon and restructured in the next section.

Selected excerpts

1.1 Opening scene; Exploring and communication

[2-4] **George:** *Oh maar ik heb iets voor onderhouden... Een hele grote gieter, en dan laten we het zo regenen. En als er veel water in zit dan gaat die gieter automatisch langs alle planten en gieters*
[5] **Ella:** *Ja maar dan heb je...* **Jane:** *Nee dan moet je...[Steekt hand op]*
Layla: *Als...* **George:** *Dus...*
[6] **Ella:** *Maar [\\\]* **Jane:** *[Breekt af; laat hand zakken]* **Layla:** *Shhh! [schermt Jane af met arm]* **George:** *het water*
7 **Ella:** *maar de buurtbewoners wouden dat het er mooi uitziet, en hele grote gieters, dat ziet er niet mooi uit.*

George immediately dives in head first by sharing his solution based on the requirement of low maintenance that was given to him [2-4]. The idea is a bit bold and the reactions are mixed [5]. Layla responds to the chaos erupting at lines 5-6 by mediating the conversation, using hand gestures to silence Jane and to allow George to speak (though Ella takes the opportunity). Ella's response [7] is that his solution does not look nice, which is a competing requirement that was given to her.

8-10 **Layla:** *Ja, maar we kunnen wel een beetje een soort van wat George zei, alleen dan niet dat 'ie automatisch; maar bijvoorbeeld al het water gaat in een ton en dan heb je daar zo'n kraantje, dan,*
11 **Ella:** *ja*
12-14 **Layla:** *die maak je dan bijvoor- jij maakt die dan met allemaal bloemenstickers erop.* **George:** *Ik weet wat*
15 **Ella:** *Ja*
16 **Jane:** *Dan moet je die gieter aan een kabelbaan hangen dat 'ie dan zo begeleidt* **George:** *Ik weet wat... Nee, we hebb-*
17 **Layla:** *[Kijkt naar Jane] We hadden toch al... [wendt blik af] ja, is wel zo.* **George:** *Nee, ik weet, ik weet*

Here, Layla continues in the mediating role by crediting George for his idea [8] and taking Ella's criticism in consideration [14], but putting forward a new idea. Ella confirms Layla in her idea [11;15] and nobody

reacts against it so Layla's idea seems accepted. However Jane is continuing on George's old idea [16]. Layla responds by addressing the misunderstanding, but then backs down mid-sentence [17]. Layla's behaviour can be interpreted as showing she is not confident enough to vocalize and find the right words. Her softly spoken 'Yeah, that is true' softens her earlier objection and relieves her from the expectation that she will make her argument, even though it seems clear that it is not what she thinks. Maybe she is also worried she might sound snappy. Meanwhile George's repeated interruptions [13;16;17] probably contribute to both Jane's misunderstanding and Layla's decision to leave it be.

18 **George:** *We hebben zo ergens een grote ton staan en dan gaat het regenen, en het zijn allemaal buisjes, die leiden naar iedere plantje en als daar water in gaat*

19 **Layla:** *Ja maar dat is toch niet handig?* **George:** *dan verdeelt alle water over de plantjes*

20 **Ella:** *Dat is niet zo handig* **Jane:** *[ik-heb-een-idee-gezicht]*

21-22 **Jane:** *Of... [beklemtoond]* **Layla:** *Da's nie-, of we, je kan toch net zo goed even de gieter pakken en dan zo doen*

23 **Ella:** *Ja, dat is ook leuker om te doen*

24-25 **Jane:** *Maar ik heb wel het idee* **Layla:** *Ja anders gaat het allemaal automatisch*

We can see Jane responding before George finishes [19], and while she says his idea is not practical she provides no argument. The real reason surfaces at line 23-25. She and Ella like the idea of watering the plants. So we see that the reasoning is there, but articulation is a challenge.

26 **George:** *Ja, maar Het moet makkelijk onderhouden worden toch*

27-28 **Ella:** *Ja maar het is makkelijk onderhouden, kijk er zit allemaal regen in,* **Jane:** *Ja maar ik heb, [breekt af]*

29 **Layla:** *Ja, wat is je idee?*

30-31 **Ella:** *je doet kraantje open... gietertje* **Jane:** *Ik heb een makkelijk- [geeft Ella een tik op haar handen]* **George:** *Hun lopen voor!*

32 **Jane:** *Ik heb een... ik heb een makkelijk-*

33 **Jane:** *Nou en* **Layla:** *Nou en*

34 **Jane:** *ik heb een makkelijk onderhoudenen*

From line 21 onwards [21;24-25;27] we see Jane trying to voice her idea. Layla notices, and gives her the opportunity [29]. This emboldens Jane to be a more assertive, cutting off Ella [31] and George [33]. While

George uses big gestures and a loud voice to get attention [13;16-17], Jane is soft-spoken, calm and persistent, consistently using the same words.

- 35 **Jane:** *Als we nou... van steentjes zo'n torentje maken dat we dan zo plantjes erin zetten, als je dan boven water giet en de plantjes boven genoeg water geeft dan stroomt het zo naar beneden*
- 36 **Ella:** *Dat is grappig!*
- 37 **Layla:** *Nee aan het midden, dan heeft het zo'n, soort van taartvorm*
- 38 **Jane:** *Ja* **Layla:** *en die gaat dan zo daar, en daar en daar één, en daar één en daar één.* **George:** *Ik weet...*
- 39 **Ella:** *Nee wij hebben niet...*
- 40 **Layla:** *Ja maar hoe gaat het dan, de plantjes* **George:** *Ik weet hoe...*
- 41 **Jane:** *Ja...* **George:** *Ik weet [slaat op tafel] hoe het makkelijk onderhouden kan worden*
- 42 **Jane:** *die plantjes doe je dan tegen een berg aan.* **George:** *Als we gewoon één bloem plaats.*
- [...]
- 50 **Layla:** *Maar, Jane, dat was op zich wel een goed idee maar dan kunnen we net zo goed alleen gewoon met de gieter, want anders, waar gaat dan de buis, ja*
- 51-54 **Jane:** *Nee maar kijk... [afgeleid] Kijk Layla, als de plantjes genoeg hebben, dan laat het water los toch?*
- 55 **Layla:** *Nee, even wachten [richting Ella, slaat op tafel]*
- 56 **Jane:** *Als de plantjes genoeg water hebben dan laat het los toch? Laat het water los.*
- 57 **Layla:** *Maar we kunnen toch ook gewoon...*
- 58 **Jane:** *Dus dan stroomt het water weg.* **Layla:** *Dat is wat wij hadden, dan, want jij, wat heb jij?*

Jane's plan is well articulated. She has not been as engaged as the others in the conversation, which allowed her to think on her idea. Although Ella and Layla are initially enthusiastic, George is not paying attention. With a lot of noise, he suggests a new and somewhat absurd idea. Ella and George start their own discussion [line 43-58; not shown] drowning out the conversation Layla and Jane are trying to continue [50-57]. Layla has a hard time grasping Jane's idea and is mixing in parts of earlier ideas [50]. The chaos is preventing Layla from getting her thoughts in order.

Summarizing what we have noted so far we see Layla making a conscious effort to manage the conversation, though despite her efforts the process is easily derailed. We see the children engaging in discussion, but they can find it hard to think clearly or to articulate thoughts. In turn, this

has an influence on the conversation and the way conflict is handled, or avoided. There is a large amount of noise and chaos. When Jane explained her idea, this chaos was temporarily lifted, but George drew the group back in. We see no strategy, other than suggesting one idea after the other. We have not seen anything, so far, that shows an awareness of the fact that exploration is required in this initial stage. We do see that some of the requirements given to each of them are referenced when discussing the positives and negatives of an idea.

1.2 Task requirements, structuring, and leadership

So far, the ideas of the children mainly revolve around it being easily maintainable, as well as being pretty. These are requirements given to George and Ella respectively. In the previous section we saw George suggesting to have just a single flower to reduce maintenance. This triggers a reaction.

45 **George:** Gewoon één bloem!

46 **Ella:** De buurtbewoners vinden het **Jane:** Één bloem, dat is toch niet mooi **Layla:** Ja [klikt tong]... even!

47 **Ella:** Misschien moeten we allemaal ons kaartje voorlezen: De buurtbewoners vinden het...

48 **Layla:** Nee Ella, dat hoeft niet **George:** [Leest kaartje snel voor, gooit briefje demonstratief neer]

49 **Layla:** Maar Ella dat heeft de juf net allemaal voorgelezen dus dat hoeven we niet nog allemaal nog een keer

Ella notices that they are stuck due to George's extreme focus on low maintenance, and she realizes all requirements should be part of the conversation. She suggests reading all cards again, but Layla cuts her off. Though Layla's response is to Ella, line 46 suggests she is already annoyed by chaotic George. She wants to get back to the topic they were discussing before George got them side-tracked and simply wants no distractions. They thereby miss a chance for the group to have a more systematic approach. Her statement also suggests they already know what is on the cards, but the conversation does not reflect that. Later on [58, 118] Layla corrects her mistake.

58 **Layla:** *Dat is wat wij hadden, dan, want jij, wat heb jij?*
59 **Jane:** *De leerlingen* **Layla:** *[leest kaart van Jane]*
[...]
109 **Jane:** *Ella, ik heb een idee hoe we in de lente, zomer, winter, herfst ehm plantjes kunnen oogsten.*
[...]
118 **Layla:** *Wat heb jij wat heb jij wat heb jij*
119 **George:** *Huh nee, deze is van mij. Dat het onderhouden moet worden.*
120 **Layla:** *De directeur vindt het belangrijk dat de tuin gemakkelijk onderhouden kan worden. Je moet er ook nog goed bij kunnen [leest zachter verder]* **George:** *Maar deze is leuk, kijk [speelt met briefje]*

So Layla does want to read some of the cards a second time [58, 118], though she reads it quietly. She needs to know the task requirements because she is in control, but it does not enter her mind to discuss them in the group. At line 109, Jane for the second time comes forward with a well-thought-out idea that can function as a framework to add other ideas to. Ella and Layla respond positively. Meanwhile George is playing with the laminated cards.

121 **Ella:** *Maar George jij moet even zeggen dat er paadjes komen, ik moet...*
122 **Ella:** *ik wil gewoon dat het er leuk uit ziet.* **Layla:** *Oké, dus moet je ook een beetje paadjes maken, moet wel een beetje een... [undirected speech, as if thinking aloud].*
123 **George:** *Oh zal ik de paadjes zo meteen gaan maken? [does not notice Layla; responds to Ella.*
124 **Ella:** *Ja, doe jij maar de paadjes*

While Layla is reading the card to figure out what George has to do, Ella has also noticed the problem with George. At line 121, she points out George's role to him. She has noticed him being disengaged. Her framing [121-122] suggests she believes everybody should focus on his/her own responsibility, but she does monitor the other group members [121, 149] and engages and directs George. Layla is also monitoring others, but is mainly focused on having an overview for herself. She makes sure she is in control, but does not engage the group.

In general, neither Layla nor Ella is facilitating a an open group discussion about what the next steps are. They both take on a central role at times. Ella shows some strategic awareness, and she has an eye out for

the functioning of other group members, but she does not take leadership. Layla is actively facilitating conversation but is not sufficiently engaging the group and lacks strategy. To put it another way, there is not anything in particular 'on the agenda'. Ideas are being brought up that can be accepted or denied, and there are tasks to be executed, but no plan is discussed. The requirements on their cards are a starting point for ideas, and also provide criteria by which to judge them. But there is no shared overview of all requirements. In the end, it is Jane that provides the group with structure through a well-thought-out idea, underlining how important individual creativity and thought is for the result of the group. With Jane's plan comes a general idea of the end result to work towards.

1.3 George feels insecure. Ella cheers him up.

We have seen George clowning and being disengaged. When Ella gives him a task, his reaction is enthusiastic - happy to have a contribution to make. His impulsivity and the concern this elicits in others create interesting interactions.

126 **Ella:** *Ja maar eerst moet je eventjes de vakjes tekenen*

127 **Layla:** *Even, maar wel echt mooi hè, echt je best doen*

[...]

144 **Ella:** *George, mag wel wat mooier hè*

145 **Layla:** *[pauzeert] Ja... ja... ja, iets mooier mag wel hè*

146 **Layla:** *Probeer maar anders, dit is, even zo'n liniaal. Kan ook zo overtrekk- zo. George, doe gewoon zo*

[...]

174 **Layla:** *[gepijnigd gezicht] George: Paadjes toch hier ergens heen?*

Since he is in charge of drawing footpaths, George is also made to draw the ground plan. He gets a lot of comments while drawing, and Layla itches to take over. The meddling is slowly starting to make George insecure.

177 **George:** *Ik kan zo niks zien Layla. Doe maar, ik, ik doe het, ik kan het wel goed toch?*

178 **Jane:** *Wow wat goed..*

179 **Jane:** *Applaus [klapt in handen] Layla: Nou en, als George dat goed vindt, dan vindt hij dat goed.*

[...]

188 **Jane:** *Oké ik snap de logica van George niet.*

189 **Ella:** *[buigt lachend voorover]* George
190 **Jane:** *Volgens mij heeft George niet eens logica*
191 **Ella:** *[lachend]* Tuurlijk wel!

George's explicit need for confirmation [177] makes Jane decide to mock him with a cynical applause. Layla defends him, but sounds very belittling doing it. However, both Jane and Layla's comment do not seem to register with George. Then Jane doubles down on mocking George [188,190]. This time Ella defends him. For now, the attacks still don't seem to register as George proudly looks down on his drawing.

230 **George:** *Maar Ella, waarom kan jij dat zo mooi en ik niet*
231 **Ella:** *Jij kan dat ook mooi, maar ik moet dat doen.*
[...]
234 **George:** *Maar ik vind het niet leuk dat ik niet kan tekenen.*
235 **Ella:** *Jij kan wel tekenen!*
[...]
239 **Ella:** *Ja maar je mag ook allemaal bloemetjes overal... hier jij mag hier straks ook allemaal groentetjes tekenen zo hè.*
240 **Ella:** *Ja, zo, ja* **Layla:** *Ella, je klinkt nu net als je moeder*
George: *[Knikt hevig]*
241 **Ella:** *Maar dat mag ook wel hè?*
242 **Layla:** *Maakt niet uit, maakt niet uit... Vind ik gewoon grappig.*
[...]
245 **Jane:** *Maar stipjes zetten is wel echt George*
246 **Ella:** *Ja echt typisch George*
247 **Jane:** *Ja typisch George*
248 **George:** *Ja maar ik kan ook zo goed stipjes zetten.*
249 **Ella:** *Ja, dat kun jij echt perfect!*
[...]
299 **Layla:** *Wat wordt dat George?*
300 **George:** *Een courgette [lachend]*

While George is dotting the footpaths, representing sand, he notices Ella can draw much better than him. He articulates his feelings well [230, 234]. Ella's response is to comfort him, telling him he can draw, and also giving him a task to look forward to. Initially sad about his lack of skill, George is comforted by the prospect of making a contribution. Meanwhile, Layla and Jane seem uncomfortable with the patronizing encouragement that Ella gives and George needs. Layla feels the need to mock it, but then decides to soften her remark. Jane finds her own way to somehow both mock and support him, as if to say, George is a little different, but he is part of the team. As before, the sarcasm seems to

elude George. Ella skillfully neutralizes any negative undertones. She very briefly counters Layla's cynical remark and even makes sure that George does not notice Jane's sarcasm by repeating everything Jane says in a non-cynical tone voice. Eventually, George is much more light-hearted about his shortcomings and is able to laugh about himself [300]. It is a valuable learning experience for George, as well as for the others.

So we see the group making negative comments. We also see George sharing his emotional distress that results from this. It invites Ella to help regulate his emotions. She does so successfully, and she defuses the negativity in the group. George's vulnerability unintentionally persuades or forces Jane to be more constructive towards him.

#1.4 Conflict about the shed's perspective.

102-103 **Ella:** *en dan kun je het schuurtje open laten tekenen zodat erboven het dak eraf is.*

104 **Jane:** *Ik heb, Ella, kijk [breekt af]* **Layla:** *Ik doe het schuurtje wel gewoon zo Ella, kijk.*

105 **Ella:** *Oké dus ik moet bloeiende plantjes maken* **Layla:** *Ella, ik doe het schuurtje wel gewoon zo.*

106 **Ella:** *Nee, want dat is niet..*

107 **George:** *Nee, doe gewoon vierkant, zo [doet voor] vierkant.*

108 **Ella:** *Ja, want daarin kun je dan allemaal schoppen enzo tekenen. [...]*

143 **Layla:** *Ella, ik kan niet van bovenaf tekenen dus ik doe ook gewoon zo'n dak. [Ella hoort het niet]*

[...]

163 **Ella:** *Layla waarom ben je hem nu toch van..*

164 **Layla:** *Omdat, ik zei net, ik kan dat niet.*

165 **Ella:** *Ik wil het toch wel* **Layla:** *[gaat door op eerder onderwerp]*

166 **Layla:** *Maar Ella, ik mag hem best zo tekenen.*

167 **Ella:** *Ja maar het ziet er echt super gek uit, nu lijkt het net een raam met een huis ernaast.*

168 **Layla:** *Nou en, dan lijkt dat maar zo.*

169 **Jane:** *[lacht] sorry* **Layla:** *[Haalt schouders op]*

170 **Layla:** *Ik doe m'n best, dus. Kijk als je dan zo een paadje hebt, en dan ook nog zo. Dan heb zo'n paadje, en dan.*

[...]

182 **Layla:** *Het is een lelijke schuur [over haar eigen tekening]*

In this section we see the domino effect of bad communication. Layla decides [143], in spite of what she discussed with Ella [102-108], to draw the shed from the side instead of from above and share this with Ella to

make sure she understands. But when this uncomfortable message gets lost in the squabble, she does not repeat it more clearly. The fact that she quickly tries to get back on the previous topic [165] arguably reveals that she knew Ella did not hear her earlier. Although the conflict is quickly resolved when Layla takes a stand [166-170], we see Layla process the conflict later on by accepting that her drawing could have been prettier.

1.5 Conflict about Layla's meddling.

391 **Ella:** *Ja maar waar moet nou de ton met water* **Jane:** *Jongens we moeten bijna ophouden, weet je nog zonet.*
392 **Jane:** *Anders zet je het naast het schuurtje neer*
393 **Ella:** *Blauwe ton* **Layla:** *Ja Ella snel!*
394 **Layla:** *En dan zo en dan rondje en dan strepen*
395 **Ella:** *Ja* **Layla:** *Rondje en stre-*
396 **Jane:** *Maar wie weet nog iets dat in de winter groeit* **Layla:** *[ademt in] en dan doe ik visjes tekenen [stuitert zenuwachtig]*
397 **Ella:** *En dan moet ik even, wacht, zo*
398 **Layla:** *Zo, zo, zo!*
399 **Ella:** *een kraantje... nee*
400 **Layla:** *Dat is, dan kan je zien dat de visjes erin zitten*
401 **Layla:** *En dan effe zo de ton, en dan visjes tekenen, mag ik een visje tekenen?*
402 **Ella:** *Nee, want ik-*
...
406 **Layla:** *En dan kraantje. Kraantje, hier aan de zijkant!*
407 **Ella:** *Ik kan zelf ook wel tekenen*
408 **Layla:** *Aan de zijkant*
409 **Ella:** *Maak dan even een groene gieter, wij hebben thuis ook altijd groene gieter*
410 **Layla:** *Donker groene*
411 **Jane:** *Maar wie wil m-, wie niks te doen heeft, help mij alsjeblieft met de wortels want het hele veld moet nog*

Ella takes up a forgotten task, the water reservoir. When Jane mentions time pressure, Layla starts to get restless [392-396]. Layla doesn't have anything to do, and starts to focus on Ella's work. Layla actually takes over the drawing [397] and Ella gives her space, even though she says she disagrees. Layla then asks [401] whether she can draw fishes and starts directly. Again, Ella gives Layla space, though under protest [402]. The third time Ella disagrees, she communicates more clearly [407]. Layla backs off, but continues to comment. Ella understands that Layla should also have something else to work on and does a suggestion [409].

That prompts Jane to say she could use some help. It shows that Jane and Ella see the real problem - Layla having nothing to do - instead of just the symptom of Layla's meddling.

2.1 (Not) making plans

- 1 **Rosa:** Oke, ehm **Kayleigh:** Wat gaan we tekenen?
2 **Rosa:** Ik wil... **Josh:** Maar ik wil paadjes tekenen
[...]
6 **Josh:** Zullen we dan steeds een vierkantje doen?
7 **Rosa:** Nee, dat- nee **Kayleigh:** Nee, wacht...
8 **Rosa:** ik zou eerst mooi, een b- gewoon mooie- hele lange tegels zetten zodat je niet al die kleine blokjes ziet.

Kayleigh takes the lead by asking what to draw. This should make creating a plan the focus of the conversation, but the others focus on details. In Josh's initial reaction [2] the 'but' suggests he just want to draw instead of talking about what to draw. He does cooperate in line 6 though, by providing a more general suggestion, less focussed on detail. But Rosa interprets his square elements as square tiles [8], so the focus is back on details.

- 9 **Kayleigh:** Nee jongens, eigenlijk moeten we eerst schetsen. Nou ja, eh kijk, tegels bijvoorbeeld. Moet je bijvoorbeeld maken hoe je de tegels eruit wil laten zien. En dat kun je bijvoorbeeld hier tekenen. En dan kun je op de andere kant de andere tekening. De echte
10 **Rosa:** Maar, vind je het goed als er... als ik nu het hele strandse bomen teken?
11 **Kayleigh:** Nee, één klein- in het klein even laten zien
12 **Rosa:** Dat gaat echt niet mooi worden hoor, als je mij-
13 **Kayleigh:** Niet suuper klein, maar [lachend]
14 **Rosa:** Ik wil- ik teken gewoon een hele mooie... [starts drawing]
15 **Kayleigh:** Want we willen graag weten...
16 **Josh:** Niet echt supergrote.

Kayleigh's proposal to make a sketch first is heard, but not confirmed by the others. It does not fit Rosa. Although Rosa has participated in first just sharing views [8], a moment later she focusses on what she wants to do right now, which is to just make a pretty drawing of a palm tree [10]. This derails the process, and the general plan or outline is not discussed for the remainder of the assignment. We

- 58 **Josh:** Dat is al een kwart van ons blad [over palmboom]

[...]

61 **Josh:** *Ja het is wel mooi maar hier kan je niet overheen kijken*

62 **Rosa:** *Hier moeten heel veel kokosnootjes en bananen* **Josh:** *Want ze zei, je moet...*

63-69 **Kayleigh:** *Nee, kijk. We vinden het belangrijk dat het er mooi uitziet- oh, de buurtbewoners vinden het belangrijk dat het er mooi uitziet, en er geen hoge en grote gebouwen te zien zijn- dus er moeten juist hoge planten zijn- ze houden van bloeiende planten. Het is dus belangrijk dat de buitenkant van de tuin er goed uit ziet en er mooie groene en bloeiende planten zijn.*

70 **Rosa:** *Dit is een mooie en bloeiende plant,*

71 **Kayleigh:** *Ja maar kijk, me- meer*

72 **Rosa:** *met kokosnoten [lacht]*

[...]

157 **Rosa:** *Of je moet een beetje, ehm, bloemetjes dat stond hier.*

Rosa's palm tree takes up a lot of space. Josh [61,62] and Kayleigh

[63-69] make an attempt to adjust the course by quoting one of the requirements, but Rosa dodges by using humour. She does not engage and keeps drawing. Other than a small mention at line 157 and an earlier mention of paths [2], the requirements written on the cards play no role. The temptation to just start drawing something has undermined Kayleigh's attempts to have a more systematic approach.

2.2 Tension between Kayleigh and Rosa

21-23 **Kayleigh:** *Nee stop [schermt af met handen]! Maar, je tekent een palmboom meer zo he? Oke, ik doe het nu niet op m'n- nee stop! Wacht heel even. Ik teken het nu niet op m'n allermooist maar... even kleiner.*

24-25 **Rosa:** *Nee maar als je klein- oke nu maak je even een klein palmboompje.*

26 **Kayleigh:** *En dan heb ik eigenlijk nog een kleur nodig*

[...]

28 **Kayleigh:** *Wacht jij nog even met tekenen Rosa want dan kan ik even iets laten zien...*

Kayleigh is apparently not satisfied with Rosa's drawing of her palm tree and she decides to make an example of how you should draw a palm tree. She repeatedly urges Rosa to stop drawing and look, but Rosa is undisturbed and keeps drawing. In turn, Rosa is bothered by Kayleigh's drawing, but quickly rationalizes her irritation by basically saying that Kayleigh's drawing does not affect her own. What follows is Kayleigh - and sometimes Josh - repeatedly commenting on Rosa's tree, while Rosa completely ignores the comments or brushes them aside [41-43, 49-70]. Although Kayleigh is

confronting Rosa, she does not really press her. The growing conflict remains unresolved because it is avoided, but that is also exacerbated because both parties have trouble articulating their thoughts and are easily distracted.

92 **Josh:** *Rosa?*
93 **Rosa:** *Oh ja, dat snap ik wel*
94 **Rosa:** *Ja ja. Josh:* [tik tegen stift van Rosa] *niet verder tekenen!*
95 **Rosa:** *Halloo, ik ben bezig.*
96 *[All laughing]*

The fact that Rosa is drawn in very much by her work is a factor in itself that is preventing communication, but she also uses it as a cover to hide behind. Josh is more directly addressing this problem, but he also does not press her enough.

2.3 Sketch or real drawing

We discussed Kayleigh's proposal to make a sketch first. Rosa secretly disagrees, and this conflict slowly escalates.

97 **Josh:** *Eh, dit is nog niet onze echte tekening he [kijkt Rosa aan]*
[...]
254 **Josh:** *Jongens, weet dat we nu hier nu echt al 5 minuten aan het werk zijn, terwijl we nog echte moeten maken [eigenlijk 13 minuten]*
255 **Kayleigh:** *Ja, maar, we weten nog niet of dit wel goed is*
256-257 **Rosa:** *Dit is de echte. Dit wordt de echte.*
258 **Kayleigh:** *Niet!*
259 **Josh:** *Jawel!*
260 **Kayleigh:** *Nee, dit is toch allemaal... [schudt hoofd] dat ga ik niet op de echte tekenen*
261 **Rosa:** *Maar dit is het ech-, dit is de echte*
262 **Josh:** *Laat me niet uitschieten*
263 **Rosa:** *Nee niet doen! Kayleigh:* *Josh niet doen!*

The earlier proposal by Kayleigh to make a sketch first [9] was not confirmed, but Josh is apparently on board [97]. By looking at Rosa he suggests he realizes the matter is still unclear. Only after the 13th minute, Rosa's actual opinion is revealed [255]. When Josh hears that his stance on the matter switches. But even though the difference of opinion has come to light, they all allow it to stay unresolved, avoiding real conflict. For this reason, distraction is welcomed [262-263].

- 289 **Kayleigh:** *Oke, achterkant nu... achterkant nu jongens.*
290 **Josh:** *Nee we moeten deze kant vooro-, gebruiken.*
291 **Kayleigh:** *Nee maar dit wordt...*
292 **Josh:** *Ja maar dat moet, anders hebben we echt geen tijd meer.*
293 **Kayleigh:** *[Zucht]*
294 **Josh:** *Oké go, go, paadjes, paadjes, alles, alles*
295 **Kayleigh:** *[draait snel blaadje om]*
296 **Rosa:** *Nee, maar d- dit- dit was juist... [draait blaadje terug]*
Kayleigh: *Jawèèèl! Josh: Neeee! [handen op hoofd]*
297 **Rosa:** *D- dit- dit was juist de...*
298 **Josh:** *Dit moet hem juist worden.*
299 **Kayleigh:** *Nee, maar we zijn het er helemaal niet over eens dat deze er bij moet.*
300 **Rosa:** *Nee maar dit is d- de tekening eigenlijk*
301 **Rosa:** *[werkt rustig door] Kayleigh: [stil. Buigt weer over de tafel]*
302 **Rosa:** *Snap je het... niet?*
303 **Kayleigh:** *We hebben niet eens overlegd of die er bij kan.*
304 **Josh:** *[aan het fluiten] ... Maar doet moet wel want... [met gek halfgespeeld gestresst stemmetje; plat op tafel] we hebben bijna geen tijd meer ja!*
305-306 *[all laughing]*
307 **Kayleigh:** *Ja, ik heb al geen tijd om deze hele klimop te doen*

Kayleigh and Rosa both use the same tactic, stating their own position as fact, not acknowledging the other and pretending there is no argument. Rosa is not looking up from her drawing at all and Kayleigh tries to force her way through by quickly flipping the page [295]. After this confrontation, Kayleigh finally articulates her concern [299,303], but Rosa does not acknowledge it. Josh mentions time shortage as a compelling reason to use the existing drawing as the real thing. He also uses humour to ease the tension. Kayleigh eventually submits [307].

2.4 Tension between Kayleigh and Rosa (continuation)

- 122 **Kayleigh:** *We hebben gelukkig wel een leuk groepje.*

Kayleigh is bothered by the building tension between her and Rosa. At the same time, the group is having a lot of fun. Her comment here sounds like a sigh of relief. But the tension remains though and her inability to engage with Rosa will cause her to act in a passive-aggressive way.

- 171 **Rosa:** *Ik weet iets heel leuks over een paaltje*
172 **Kayleigh:** *Waarom moeten we een paaltje eigenlijk.*
[...]
174 **Rosa:** *Dan zie je zo'n paaltje en daar hangen zulke bordjes aan.*

175 **Kayleigh:** *[big gasp] Ik weet iets heel leuks*
176 **Rosa:** *En daar staat bijvoorbeeld die kant moestuin, die kant bomenparadijs, die kant de klimop*
178 **Kayleigh:** *Nee kijk, ik weet zo een paaltje, kijk!*
[...]
310 **Rosa:** *Gewoon sliertjes met een paar bloe- met een paar bloemetjes erop?*
311 **Kayleigh:** *Nee, dat lijkt net op speeksel*

When Rosa has an idea, Kayleigh instantly disparages her suggestion, before Rosa has given any details. Then when Rosa explains her idea, Kayleigh tries to shift the attention back to herself. After the escalation at lines 289-307, she repeats the same behaviour.

321 **Kayleigh:** *Nee- oh, wat heb je gedaaaan?*
322 **Rosa:** *Dat is het steeltje van de bloem maar daar...*
323 **Kayleigh:** *[Tekent iets]*
324 **Josh:** *Wat doe je nou?*
325 **Rosa:** *Nu heb je hem helemaal verpest!*
326 *[All laughing]* **Kayleigh:** *ik heb een ster getekend*
[...]
329 **Rosa:** *Teken klavertjes*
330 **Josh:** *Teken een klavertje 8*
331 **Kayleigh:** *Ja, ik ga gewoon een mislukte klavertje tekenen*
332 **Josh:** *Ik ga... ik ga een klavertje 8 tekenen*
333 **Kayleigh:** *1, 2, 3- goh* **Josh:** *Geef mij groen [pakt stift af van Kayleigh]*
334 **Kayleigh:** *Hier is de dop*
335-336 **Kayleigh:** *Goed, dan gaan we het domste klavertje ever maken. 1, 2, 3, 4, 5, 6, 7.* **Josh:** *Je weet dat dit onze echte is hè?*
337 **Kayleigh:** *Ja, maar dit is een klavertje 7 [lacht]* **Josh:** *[lacht]*

Kayleigh is responding to something Rosa drew [321]. It might be the straw that broke the camel's back, or she might just use it as an excuse, but either way Kayleigh starts clowning and actually sabotaging the work. Josh does not mind this at all and cheers her on, while Rosa is stoically focussed on her own part of the drawing.

401 **Rosa:** *Wat vind je?*
402 **Kayleigh:** *Te groot, maar goed*
403 **Rosa:** *Oke, we moeten hier allemaal tuintje-, eh hele heel veel tuintiertjes maken.*

A final revealing interaction. Rosa asks for Kayleigh's opinion, but when it is clearly negative, Rosa simply continues as if she heard nothing. She is just doing her own thing. Rosa and Kayleigh are locked in a state

together. Kayleigh's reaction is also more overtly passive aggressive here, reassuring us that the other interactions can also be interpreted that way.

3.1 Rolling up the sleeves

- 1 **Steve:** *Er moet een schuur komen, waar gaat de schuur komen jongens.*
2 **Timmy:** *Ja de buurtbewoners vinden het belangrijk [leest voor zichzelf hardop]*
3 **Ron:** *Ik zou de schuur..*
4 **Timmy:** *Dat er niet grote gebouwen aan de zijkant zijn, dus het moeten villa zijn, haha, nee grapje.*
5-6 **Ron:** *Ik zou hier gewoon, hier het schuurtje doen.* **Steve:** *Een heel klein schuurtje, een heel klein schuurtje gewoon*
[...]
10 **Ron:** *En paden!* **Timmy:** *Dus, ik moet de h..*
11 **Steve:** *Ja, er moeten paden komen, maar die paden kunnen we beter van gras doen.*

Steve takes the initiative. His opening [1] determines the conversation. By saying 'there needs to be a shed' he references the requirements, triggering others to do the same. By asking where the shed should be, he puts the focus on immediate action. And by closing with 'boys?' he invites discussion and group decisions. We see Ron following his lead, joining the conversation on the shed [3-6] and referencing his own requirements [10]. At the same time, Timmy is struggling to understand his card [4,10]. He gets distracted.

- 19 **Ron:** *Zo, zeg maar zo. Hiervan het paadje [tekent al]. En dan een beetje groen erdoorheen.*
20 **Steve:** *Ron, daar waren we het nog niet allemaal mee eens, maar ik vind het wel goed. En dan komt aan deze kant de schuur.*
[...]
22 **Quentin:** *[has been totally disengaged and looking hurt and averting his gaze; now plays with his card]* **Steve:** *Dus dan komt hier dat paadje. [Looks at Quentin]*

Ron puts the marker on paper after half a minute. Steve notices this has not been agreed upon, but is quick to add that he does not mind. Steve and Ron are basically the only ones really participating, and Steve's remark here underlines this: Ron acts and Steve is okay with it, so there is no problem. Meanwhile, the fourth member of the team, Quentin, is strikingly disengaged. Steve notices, but does not seem to care much. And Timmy is still struggling with his card.

- 23 **Timmy:** *We moeten ook huizen aan de [\\\]*
24 **Ron:** *Helemaal niet* **Steve:** *Nee, helemaal niet*
25 **Timmy:** *Jawel*
26 **Steve:** *Juist niet*
27 **Timmy:** *de buurtbewoners vinden het belangrijk dat de tuin er mooi uitziet en er geen hoge en grote gebouwen te zien zijn.*
28 **Ron:** *Geen grote, en hoge. Ja, ik zei het toch.*
29 **Timmy:** *Ja maar dan moet je ze toch- dan moet je toch geen grote gebouwen tekenen*

Timmy thinks he has understood and selected a specific requirement from his card, like Steve's shed and Ron's paths. But he misunderstood, and the others correct him.

- 32 **Ron:** *Laat mij de modder maar doen [hij bedoelt paden].*
33 **Steve:** *Ja, oke.*
34 **Ron:** *Wat doe jij? [richting Quentin]*
35 **Quentin:** *[Shrugs shoulders; averts gaze]*

Ron decides to stop discussing the shed with Steve, and focus on the paths. This awareness of 'each his task' makes Ron turn to Quentin, but for now, Quentin stays disengaged.

- 36 **Steve:** *Nee wacht nog heel even [takes marker from Ron], ik moet nog even zo doen*
37 **Ron:** *Maar nu doe jij alles*
38 **Steve:** *Nee, wacht heel even. Ik bedoel... kijk, hierna stop ik hè. Kijk dit is even het paadje dat ik naar de schuur wil. Zo, nu doe jij de modder [i.e. paths]. Timmy, jij moet ook nog iets doen.*
[...]
40 **Timmy:** *Ja, wat moet ik doen?*
41 **Steve:** *Weet ik niet... [nadenkende toon]*
42 **Timmy:** *Maar er moeten ook wel planten zijn*
43 **Ron:** *Ja, dat...* **Steve:** *Ja, maar dat gaan we zo meteen doen.*

Ron is worried Steve will take over his work. Apparently, Ron is not only worried about everybody having a task for efficiency, but also for a fair distribution of work. Steve is reaffirms that Ron is in charge of the paths, and he turns to Timmy, stating he should also do something. Timmy's card to lacks a specific item that the design should have, so he does not know what to do. But when he does a suggestion - even though Ron agrees - Steve cuts it down. Quentin remains remarkably unmentioned.

- 119 **Ron:** *Waarom doet Quentin eigenlijk niks [not looking at Quentin]*

120 **Steve:** *Omdat Quentin niks doet. Quentin doet gewoon niks. [Looks up at Quentin] Quentin, wat staat er op jouw kaartje?*
121 *[Quentin drops his card and mumbles something. Timmy takes the card, reads it aloud]*

Ron, again, shows some awareness of the importance of participation by bringing up Quentin. But Steve redirects the focus away from participation. He is interested in Quentin's requirements though.

144 *En er moeten appels. Er moeten appels in de boom zitten [...]*
147 **Steve:** *en we hebben aardbeienplantjes nodig. Jongens wat is dat nou weer voor vrucht. En we hebben wortels nodig. En paprika.*
148 **Ron:** *Dat is een bes*

Steve is basically giving orders [144,147]. Ron is just drawing things [147-148]. It is a big contrast with the other groups, where an idea is brought in and then needs approval. There is very little discussion.

This group is very much just 'diving in'. There is some awareness of the importance of participation and task distribution. They also reference the requirements, but it does not stop them from immediately drawing. Although the cards have been read to them beforehand of course. Steve is a dominant leader and mainly focussed on getting things done. Making sure Timmy and (especially) Quentin are participating is not a priority at all. There is not much thinking ahead and the conversation consists in large part of quick remarks and short comments.

3.2 Quentin and Timmy

We have already mentioned Quentin being disengaged. His body language is very strong and there is clearly something going on with him. We have also seen that the group has noticed, but gives the issue very little attention. Timmy on the other hand is engaged with the group, but not really part of the process.

49 **Timmy:** *[\\ \\] What have you done!?*
50 **Ron:** *Hij maakt de schuurt [sic]*
51 **Steve:** *Een woedend schuur [sic]*
52 **Timmy:** *Ja maar...*
[...]

54 **Timmy:** *Is het misschien [switches to english] better that [back to dutch] we de hier doen...*

[...]

57-58 **Timmy:** *Maar het ziet er niet...*

59 **Ron:** *Ah, lucht. [starts colouring sky]*

60 **Steve:** *Lucht hoeft niet per se hè*

61 **Timmy:** *Jawel. [joins Ron in colouring sky] Per se! Het hoeft niet... hoeft. [cheeky grin]*

63 **Ron:** *Gast, nu verkloot je de lucht. Je moet heel licht kleuren [they are now drawing in the same area]*

64 **Steve:** *interessante kleur. Hehe.*

65 *[Quentin leans toward the others for first time while Timmy dots his marker on Steve' shirt sleeve]*

66 **Steve:** *jongen dat ging per ongeluk. Dan doe jij meteen op mijn t-shirt*

Timmy is still trying to figure out what his role is, when he sees Steve drawing something he does not like. He objects, but can not find the words and is not really acknowledged [52-58]. Timmy starts to become unruly. He joins Ron in colouring the sky but is too aggressive, and when Steve accidentally colours his hand, Timmy retaliates. The spectacle actually gets Quentin's attention.

Timmy's clowning behaviour parallels George's from the other group, who also had too little to do and started clowning. It also reminds us of Kayleigh, who was frustrated and showed (passive-)aggressive and sabotaging behaviour.

85 **Timmy:** *Ja, jij... [hands in air] ik doe niks*

86 **Ron:** *Ja dat klopt, want je doet ook niks*

87 **Timmy:** *Ja maar je laat me niks doen.*

88 **Ron:** *Ja want je wilt niks doen* **Steve:** *Dat is niet waar.*

89 **Timmy:** *maar ik heb thuis wel wat gedaan [face looks satisfied with his comeback]*

90 **Ron:** *[clicks tongue; looks at Quentin] Alleen dat is de man die nog niks heeft gedaan!*

The situation escalated quickly, but has calmed down at line 85. There Timmy says the phrase common among arguing children: 'I'm not doing anything'. Ron twists his words [86] to mean that he does not contribute. Here, the problem comes to light, yet none of the boys help Timmy find something to do. Everybody is just focused on drawing and exchanging quick remarks. At line 90, Quentin is commented upon again. Ron's words sound

accusatory, but may also just be boys talk, considering the rough tone of the entire conversation. This line, like line 119 quoted earlier, is a very explicit mention of Quentin's disengagement. However, neither instances lead to action.

164 **Ron:** *Waarom zeg je pepernoot in hemelsnaam?*

165 **Steve:** *Omdat dat in de balzak zit.*

166 **Timmy:** *Dit is opgenomen!*

167 **Ron:** *Gast, dat heeft ie opgenomen!*

168 *[All Laughing]*

[...]

179 **Quentin:** *De camera heeft het opgenomen hè?*

180 **Ron:** *Wat?*

181 **Quentin:** *Vieze man.*

Two events break Quentin's sulky state. One is the quarrel between Timmy and Steve (65), and the other is the use of dirty words recorded by the camera (164). At Line 179, Quentin speaks for the first time, also relating to dirty words being recorded, which he seems to enjoy.

239 **Ron:** *Heb jij eigenlijk piepschuim in Timmys tuin gegooid?*

240 **Quentin:** *[Shrugs shoulders]*

241 **Quentin:** *[stares in front of him]* **Steve:** *Als hij dat doet... Timmy is een goede man... En Quentin is een slechte man, nou ja, soms.*

242 **Timmy:** *Jij anders ook, en ik ook.*

243 **Steve:** *Soms ben ik de slechtste man*

244 **Ron:** *Nee, eigenlijk altijd, maar goed, boeie...*

245 **Quentin:** *[Slight response from Quentin]* **Ron:** *[laughing]* **Steve:** *[laughing]* *Camera neemt op!* **Timmy:** *[laughing]*

Apparently there has been an incident involving Quentin and Timmy. Ron addresses it directly. When the incident is mentioned, Steve attacks Quentin in support of Timmy and calls him a 'bad man'. (The use of 'man' is seemingly inspired by youth culture on youtube). Timmy and does not accept this though, and he defends Quentin. Ron seems to take sides with Timmy. Quentin notices.

319 *[Quentin touches a marker for the first time, 15 minutes in]*

[...]

323 **Ron:** *De buitenkant van het pad moet donkerder [looks at Quentin]*

324 **Quentin:** *[takes marker, starts drawing]* **Ron:** *Dan doet Quentin tenminste ook iets.*

[...]

363 **Quentin:** *Ik maak de weggetjes wat breder.*

[...]

384 **Quentin:** *Ik ga een waterplasje maken.*

[...]

398 **Ron:** *Ja, nu komt Quentin in actie!*

399 **Timmy:** *Here we go!*

400 **Ron:** *Kleine wortel!*

401 **Quentin:** *Plantjes* **Ron:** *Plantjes* **Timmy:** *hij heb ook top 10 eh, fast worker.*

[...]

429 *[everybody clowning for a while except Quentin, who is drawing]*

Ron again notices Quentin, and suggest something to do for him(323).

Quentin suddenly becomes really productive and even shares what he is doing (363, 384, 401). His engagement is welcomed and he gets supportive comments (398, 401).

3.3 Vagueness

11 **Steve:** *Ja, er moeten paden komen, maar die paden kunnen we beter van gras doen.*

12-14 **Ron:** *Graspaden, nee! Meer aardepa- aarde.*

[...]

19 **Ron:** *Zo, zeg maar zo. Hiervan het paadje [tekent al]. En dan een beetje groen erdoorheen.*

[...]

32 **Ron:** *Laat mij de modder maar doen*

[...]

39 **Ron:** *Oh nee, wacht, er moet gras in*

The fact that it is not clear whether the paths are made of grass of earth (or mud), reveals a lack of clear thinking, clear communication and clear planning. We have also seen Timmy struggling to understand his card, and is noteworthy that at this age

4.1 A good start

1 **Marie:** *Misschien is het handig als we taken- een soort van taakverdeling...*

2 **Nora:** *Ja maar ik weet niet hoe we het gaan doen, gaan we het van boven doen? Of...*

3 **Marie:** *Boven.* **Nora:** *Dat we het boven de schuur doen, zo zeg maar...*

4 **Kevin:** *Misschien is het handig om eerst te kijken wat we allemaal moeten doen en...*

5 **Nora:** *Ja wat moet jij doen? [points at Lynn; actively listens by nodding and keeping eye-contact]*

6 **Lynn:** *Ik moet zo'n schuurtje maken*

7 **Kevin:** *Ja, en dat jij- en dat iedereen z'n eigen deel een beetje daaraan denkt. En als iemand gaat tekenen zo dat jouw ding geen plaats meer heeft kan je dat gewoon even zeggen.* **Nora:** *[points at Kevin after Kevin speaks, affirming his right to speak]*

8-10 **Marie:** *Ja het is misschien wel handig als je iedereen hetzelfde tekent, want anders heb je hele verschillende formaten denk ik.*

11 **Nora:** *Ja, wat heb jij? [points finger to Marie]*

12 **Marie:** *Ik heb de directeur*

13 **Kevin:** *ik heb de leerlingen.* **Nora:** *[points to Kevin, then changes back to Marie] Ja, maar wat moet je doen?*

14 **Marie:** *Ik moet ehm, dat het makkelijk moet onderhouden kunnen worden, en de paden.*

15 **Nora:** *oké, [points at Kevin] en jij?*

16 **Kevin:** *Ja, ik heb dat er goed geoogst kan worden en dat er appel en perenbomen moeten groeien en allemaal soorten groenten.*

17 **Nora:** *oke ik heb dus dat, eh, ik heb de buurtbewoners, en hun vinden het belangrijk dat het gewoon in totaal er goed uit ziet. En dat als je er van een afstandje naar kijkt, dat het er gewoon goed verzorgt uitziet.*

18-19 **Kevin:** *dus niet te hoog. Dus geen wegen over de tuin heen.*

20 **Marie:** *nee maar we moeten kleine paadjes maken.*

A lot of forethought and procedural metacognition is showing in just a few lines. Marie mentions a task distribution [1]. Kevin suggests it is smart to get an clear understanding of the assignments requirements first [4], and he also suggest everyone mainly focuses on their own requirements [7]. Marie reacts to Kevin by stressing the importance of coordination [8]. Meanwhile, Nora is acting as the chair. By pointing and asking questions, she invites someone to speak. By actively listening, she maintains her role as chair and also encourages someone to continue. Her questions keep the group on topic. She even asks Marie to clarify [13]. All group members also give a summary of their card in simple operational terms, instead of reading their card out loud. Also noteworthy is that Nora has already addressed the issue of what perspective to take.

4.2 Perspective discussion

23 **Lynn:** *Je kan ook een beetje denken aan de oude natuurspeeltuin.*

24 **Nora:** *Ja maar hoe gingen we dat nou doen? Gaan we het van boven tekenen? Of gaan we het vanaf zo tekenen?*

25 **Lynn:** *Het lijkt mij wel goed als we het van de zijkant tekenen.*

26 **Nora:** *Ja maar dan zie je de paden niet.*

27 **Kevin:** *Kijk als we het zo tekenen is het helemaal niet handig, we moeten... zo. [het draaien van het blaadje laat zien dat hij een ander soort perspectief in gedachten heeft]*

28 **Nora:** *Wat we ook kunnen doen is door de helft, en dan deze kant van boven, en deze vanaf zo.*

29 **Kevin:** *Ja maar dan sluit de tuin eigenlijk niet echt aan.* **Marie:** *Ja, dat is wel handig. Dan moeten we het wel precies goed tekenen*

- 30 **Kevin:** *en dat is ook weer een beetje onhandig als de tuin niet helemaal aansluit, want dan zie je het hele perspectief niet helemaal*
- 31 **Nora:** *Hm, ja, oké [unclear how she could understand Kevin's point]*
- 32 **Kevin:** *een appelboom is wel een beetje deze hoogte dus zou wel handig zijn.*
- 33 **Marie:** *Ik denk dat het handig is als we het van de zijkant tekenen want daar kan je de planten ook veel beter zien enzo.*
- 34 **Lynn:** *Ja.*
- 35 **Marie:** *Dan kan je ook zien hoe hoog het schuurtje is.*
- 36 **Nora:** *Ja oké, klopt. Maar is het dan echt belangrijk- wie had de schuur?*
- 37 **Lynn:** *Ja ik.*
- 38 **Nora:** *Is het dan echt belangrijk dat schuur hoog is?*
- 39 **Kevin:** *Het mag niet hoog zijn, want de buurtbewoners willen niet dat het hoog is Marie: Nee juist niet!*
- 40 **Nora:** *Echt? Oh... had ik niet meegekregen.*

When the conversation continues, Nora brings the discussion back to the perspective [22,24]. They have a fruitful discussion; one that exhibits both good and bad practices. By being modest and underlining it is her opinion [25], Lynn invites others to respond. Nora provides the first real argument, stating that you will not be able to see the paths properly in a side view [26]. She also provides an alternative solution as a compromise [28]. These are constructive ways to engage in discussion. However, Kevin is not thinking clearly, and gives a counterargument based on a misunderstanding of the problem [27,29-30]. Nora goes along with that, even though it is impossible she really understands Kevin. This shows that a discussion can sometimes be more like a tug of war than an exchange of ideas. Then, when Marie provides a more sensible counterargument [33,35], the discussion continues. Nora is searching for another way to counter [36,38], but they get side-tracked.

- 57 **Kevin:** *Ehm, we gaan het vanaf bovenaf tekenen hè?*
- 58 **Marie:** *Nee.*
- 59 **Lynn:** *Nee van de zijkant.*
- 60 **Nora:** *Jawel, ja maar bovenaf is... want anders dan zie je toch dat pad niet enzo?*
- 61 **Lynn:** *Oh ja...*
- [...]
- 86 **Nora:** *Ja maar het is echt niet handig om van de zijkant te doen [hands in hair] Ik denk echt niet dat dat handig is.*
- 87 **Marie:** *oke, doen we wel van bovenaf, maar dan wel dat het echt goed van bovenaf is getekend. Dat je ook misschien iets van aardbeien in de tuin ziet ofzo.*

88 **Nora:** *Ja, jaja.*

Since no one explicitly disagreed with Marie's last comment on the matter [33], the issue should be resolved. But the decision was also not clearly confirmed. As a result of this, we see a disagreement on what was decided upon [57-59]. This allows Nora to restate her position [60], providing the same argument as before [26]. Her argument is validated by Lynn, making the issue unresolved again. When Nora strongly objects to the side perspective one last time, we see Marie compromising, but stressing that they should then make sure to make an accurate drawing. We could say that there was an exchange of arguments resulting in an informed decision. At the same time, we see that basically the most persistent person wins the argument.

4.3 Productive decisionmaking

43 **Marie:** *Het hoeft niet per se een moestuin te zijn.*

[...]

45 **Kevin:** *Toen ik het hoorde kreeg ik meer het voor me van een, ja eigenlijk wel een soort van moestuintje, met een pad erdoorheen, en dat pad leidt naar een schuur. En dan heb je ook nog daaromheen groene dingen. En niet te hoog.*

46 **Marie:** *ik kreeg als idee zandpaadje, van zulke kleine zandpaadjes, en daartussen ook, eh, ja, bijvoorbeeld..*

47 **Nora:** *Nee ik denk wel aan steen.*

Marie opens up the debate by saying it does not need to be a vegetable garden. The children all share how they themselves imagine their garden. In other groups, ideas are commonly either embraced or not acknowledged (discarded or replaced by shouting a new idea). However, the way they phrase their ideas here, i.e. 'I imagine it like..', it allows multiple ideas to exist next to each other. They delay judgement. It can be considered a small brainstorm.

48 **Kevin:** *Nee.* **Marie:** *Steen, nee, steen past niet echt bij de moestuin. Ik zie dan zo kleine..* **Nora:** *Ja.*

49 **Kevin:** *Ja.* **Nora:** *Ja maar het is geen moestuintje. Het is gewoon een tuin. En in een tuin is meestal wel gewoon steen*

50 **Kevin:** *Nee, ze zeiden dat ze het wel een beetje groen wouden hebben. Dus dan moeten we juist geen steen doen, want dat is niet natuurlijk.* **Nora:** *Ik weet niet wat voor tuin jij hebt, maar..*

[laughing]

51 **Kevin:** *Nou ja, eigenlijk wel, maar eh..* **Lynn:** *Miscchien..*

52 **Marie:** Een bakje kiezelsteentjes.

53 **Kevin:** Ja, kiezelsteentjes, dat is een... ja. **Nora:** Ja, dat is wel...
kiezelsteentjes, dat is wel een goeie.

54 **Marie:** Ben jij het daar ook mee eens?

55 **Lynn:** Ja.

56 **Nora:** Oke.

The conversation has now switched to more of a discussion. This discussion is also resolved by a compromise, when Marie offers a third option. Marie also checks if Lynn agrees, and Nora makes the decision official with a final 'okay'. It is this kind of communication that makes this group coordinate well.

Reflecting upon observations

We have analysed the processes within their context, making observations in how children handle a cooperative assignment. In order for these observations to give us useful insights, they need to be reorganized and formulated in abstract terms. In this section, we will reflect upon the observations from four perspectives: the cognitive, motivational, interpersonal and systems analysis perspective.

Cognitive perspective

The cognitive perspective will highlight processes that are mostly cognitive in nature. This will include the cognitive skills that the children engage for this task, and the strategies they use to approach it.

Cognitive skills. From the data it can be concluded that children often struggle with thinking and communication. This creates problems with cooperation in a few particular ways we will highlight.

One area of problems is attention. Children can be very engaged, but are also very easily distracted. If one or two of the group members are disengaged, it quickly becomes a distraction or frustration for the others. It can derail the whole group, part of the group or slow down progress. We have seen a number of factors contributing to this. Group members can get disengaged if they have no role, do not know what to do, or have an emotional blockade or frustration. Another problem related to attention is a too limited focus within the assignment. Children tend to focus on details. This makes it hard to discuss problems that cannot be solved instantly. They switch topics too fast and too often. The group conversation can also split up.

There were a number of situations where the children addressed these problems constructively. Children seem to be aware of the importance of everyone participating and having a role. Whereas in some instances, the problem of a member being disengaged was ignored, in others distracting

behaviour was called out and/or the cause for disengagement was addressed. We also see the opposite effect. Like one person can distract a whole group if he/she has a lack of attention, in the same way, if one of the children keeps his/her thoughts in order, this can help the others focus. We have seen group members actively keeping the group on topic by addressing it a second or third time. Techniques were also used to prevent the children from talking at the same time, like shushing or pointing at someone.

Another factor is knowledge and reason. The children try to use logic and reason in their thinking and in communication. They use it to understand the assignment and discuss it, and also to discuss and evaluate ideas. However their arguments are limited by what they can think and articulate. Their limited knowledge can also prevent them from really discussing a topic constructively. What this means is that a position is often not based upon the best arguments, but the most recent. We also see children objecting to a proposal, but then agreeing for arbitrary reasons. However, even though the discussions often lack real substance, the attempts at engaging in discussion might be a valuable learning experience, pushing the children to and articulate their thoughts clearly.

Strategy and approach. In the process of doing the assignment, at least the following stages can be identified. First, the group has to know what requirements are set by the assignment to have a clear understanding of the task. We can call this task representation. Successful groups rephrase the assignment using their own words. A second part is the generation of ideas. This is often the first thing the children start with, although ideally, this should start after a clear task representation. These ideas are then discussed, and decisions are made which ideas to use. While some ideas are more concerned with the details, others can provide a grand structure. Such a more general idea can give the children the confidence to commit and start drawing. During the drawing, or implementation, problems tend to arise, which are then discussed. When it

becomes clearer what needs to be done, the problems become less complex, and time pressure increases focus, a group can enter what seems like a state of collective flow.

So we can divide the process accordingly: task representation, generation of ideas (working from the structural level towards the level of detail), discussion and decision-making, implementation. Ideally, children should progress through these parts as if they were overlapping phases. In practice, some children have the tendency to just start drawing (implementation) without much forethought, while others have a more thoughtful approach. The groups also varied in the extent to which they made a distinction between ideas that offer structure and ideas that involve details. Some groups did show a conscious effort to focus on structural issues first. The groups that had a less systematic approach did discuss the requirements while they already started drawing, so they were engaging in task representation after having started implementation.

The motivational perspective

In order for the children to be engaged and energized to work on the task, they have to maintain motivation. This is a complex process that is determined by many factors. We will highlight three aspects, namely motives, emotion and feedback.

Motives. Motives, in the form of goals or needs, guide and drive behaviour. In the setting of the assignment that the children were faced with, goals were not stated explicitly. The given requirements were the main focus, and as such, functioned as goals. However, other priorities were also revealed in the conversation. The children talked about having a pretty end result, enjoying the process of drawing or wanting to draw, fairness in work distribution, finishing on time and rivalry with other groups. These were all motivating factors that played a role in discussing ideas and deciding upon plans.

When we look at motives on a deeper level, it is interesting to use Deci & Ryan's Self Determination Theory and its three fundamental needs. Behaviour and comments by the children indicated that the need for relatedness - being part of the group, having fun together - was very important. Conflict was often avoided and joking was used to smooth over tensions. In some cases, the need to have autonomy could create tension in this cooperative setting (the best example being the interaction between Rosa and Kayleigh). Finally, need to feel competence is showing when children judge their work and respond to others judging their work.

Emotion. The role of emotion can be considered to be to energize or frustrate behaviour. Emotion can be an elusive concept, but its importance cannot be denied. The most clear way that emotion can be seen to play a role is when the process is frustrated. In our sample, Quentin has an emotional blockade that keeps him from engaging. Even more illustrative is the sabotaging behaviours by Kayleigh and Timmy, who both feel wronged. In all three cases, the emotions are not dealt with constructively. In the case of George, he articulated his unhappiness and the group responded positively to his emotional needs.

We also see emotion playing a role in energizing the work. The children make a lot of jokes while working, and enthusiasm about ideas is shared, stimulating team experience.

Feedback and evaluation. To be motivated to get somewhere, you have to know where you stand. And that is why feedback is an essential part of motivation. In our data children self-evaluate while talking to themselves, and they might ask for feedback by others or get feedback without asking for it. Negative feedback occurs when the child giving feedback wants to increase the other child's effort, or when they disagree with the course of action. The children seem to be able to deal with feedback quite well.

The interpersonal perspective

By working as a group as opposed to an individual, many more processes are involved that otherwise would not be. Although we have already discussed some ways in which this affects processes of a cognitive and motivational nature, we will now elaborate upon this. We will first discuss how the children in our sample manage communication and conflicts. Then we will address communication at a higher level by looking at how they structure the group conversation and group decision-making process.

Communication. We already discussed the cognitive limitations on attention and articulation, and how these limitations in turn cause communication problems. One of these problems is that sentences are often jumbled and words can be vague, causing miscommunication. Distraction sometimes made the children misunderstand even quite clear language.

A more subtle problem was that the challenge of articulating thoughts can be uncomfortable, and the children often gave up the attempt after minimal effort. This can make it seem they agree with something while they don't, or can make them choose to not speak out about something they otherwise would. In our sample, a more chaotic conversation seemed to be amplifying this effect.

Conflicts. Ideally, two opposing views or conflicting interests are resolved through dialogue and compromise. First you argue about the issue and you try to find common ground. If that fails, either party should give in their position. In our sample, the children have no problem with disagreeing, although there is some conflict-avoidance. However, we do see the children having difficulty with arguing, articulating their thoughts and understanding each other. With little cognitive resources to discuss the disagreement in-depth, it will often be just two opinions pitted against each other. This makes them resolve conflicts in less constructive ways. Children might go for a third option, not because of its merits, but because it breaks a stale-mate. Or they will say they agree, even though

they do not understand. And in conversations that are characterized by continuously switching topics, it is much easier to leave a conflict at a stale-mate and move away from the topic, than to actually resolve it. It becomes really problematic when one of the group members gives up the attempt to articulate their concern, but silently holds on to the disagreement while avoiding real confrontation. The grievances they foster in this way, are ultimately the origin of disruptive behaviour by Rosa, Kayleigh and Timmy.

Even though the ways conflicts are dealt with are not ideal, considering the cognitive limitations described earlier, some of the methods could be considered reasonable in this context. On the other hand, group number four is showing us on a number of occasions that they can resolve conflict quite constructively. Not coincidentally, this is also the group with the most well-managed conversation.

Coordination of the discussion. Perhaps chaos in the conversation is the problem that can be most clearly observed. The children often do not respond to the previous comment. This results in them talking past each other and talking over each other. In most groups comments are generally made with a tone saying 'I have an even better idea', trying to overrule the previous idea by drowning it out with enthusiasm. Fundamentally, the problem is that the children are preoccupied with talking rather than with listening or being heard. Because of this, they often had trouble staying with one topic.

On the other hand, there were many exceptions to this rule, providing an antidote to chaos. Some children show persistence in making their point in a calm manner, repeating themselves, making sure the point is coming across ('right?'). This helps the group come together on a topic. Children also shush each other or, conversely, stimulate another group member to speak and take the stage. Or they pose a question to the group, thereby creating focus.

Most groups tend to have one person that takes up the role of leader, being more decisive than others in regulating the conversation - regardless of effectiveness. The most clear example of this is Nora. She clearly signals who should speak, and about what, through asking questions and active listening - also using non-verbal cues. She responds to what is being said and then invites others to respond to her. In that regard, she contrasts with Steve, for example, who takes the lead by dictating.

Decision-making. When we imagine a decision being made, we imagine it involving agreement and clear communication. In practice however, this is rarely the case. Oftentimes decisions are made by individual declaration. It can then be challenged or agreed upon. When it is challenged, a new topic might come along before anything is agreed upon. When a decision is declared by a member, it can also be ignored or remain unheard. When it is ignored, that can mean it is accepted, but there could also be silent dissent that surfaces later. So the rules on when something should be considered decided can be somewhat unclear. In some instances, a decision might seem final, but the children do not consider it definitive and the subject resurfaces. In these cases, at least part of the group often shows signs that they are aware of the misunderstanding. So, even though the rules are unclear, the children are sensitive to cues.

However, it is often considered a final decision if a second member agrees and no one else makes a comment, either by objecting or following up with a new issue or idea. So continuously switching topics will prevent the making of decisions. And a decision is clearer when a topic is calmly discussed. In the most clear and formal example of decision-making (see excerpt 4.3), the topic is calmly discussed, a compromise is made, the opinion of a silent group member is checked, and the decision confirmed. During the implementation phase, the children just make decisions individually, while sharing their decisions with the group.

Systems analysis perspective

We have discussed a large collection of small observations and conclusions. As we have seen, there are many processes running in parallel, and they are all part of a system of processes. Each process has its characteristic within its domain, but they are also all having an effect on each other to some extent. This makes the system very complex, containing reciprocal causation and interaction effects. In this section, we will first discuss in what way we should think about our system, what kind of model could describe it. Then we will reflect upon how any such model would be used.

Describing the system. As the previous analyses have shown, the various processes - elements of the system - are very much interdependent. If one of the process functions poorly, other processes suffer from this as well. If one process functions very well, this positively affects the entire system. One way to imagine this interdependence is through the metaphor of the weakest link in a chain: if one element fails, the entire system collapses. However, this is not quite the case here. If something goes wrong, the children can compensate in other areas. For example, when Kayleigh and Rosa are in conflict, Josh mediates. And when there is a lack of focus in the second group, Jane's independent thinking gives the group a plan to build upon, restoring focus. At the same time, some elements of the system are more essential than others. In this sense, a better metaphor might be a building or a car. A building has a foundation, bearing walls and isolation. The foundation is key and the bearing walls are important. The isolation on the other hand, is less of a priority, but is definitely part of any quality building. A car has an engine, but also has support systems that provide cooling, for example. If the coolant fails, the car will still drive, but at some point this will damage the engine. So what we want to do is identify, just like in a building or car, which elements have an essential role for the entire system to function.

At the same time, we must not forget that our system contains agency. Members of a group are part of the system, but they can also reflect upon it, and act to change it. So if we use the metaphor of the engine, the driver is part of the system. If a group member is a driver, a teacher could be considered the roadside assistance. It is the job of the teacher to fix immediate problems that frustrate the group process, but also to educate students on how to prevent these problems or fix it when they arise.

Working with the system. This brings us to another issue. How a model to describe this system would be used, should be a consideration in its design. One application would be to help teachers identify where to intervene in the group process to foster growth in their students. An important consideration is the learning goal. In an educational setting, the goal is not a good performance, but improved mastery. For a cooperative assignment, this means we want to shape the cooperative processes to create the best possible learning experiences, and a poor performance can be a very valuable learning experience. At the same time, children can also 'learn' wrong behaviour. The best illustration of the importance of these considerations is perhaps dealing with conflict. Reducing conflict would increase performance, but we also want children to learn to deal with conflict. On the other hand, we do not want children to 'learn' conflict avoidance (or at least not as their primary strategy), even though conflict avoidance can be rewarding in the short term. The same reasoning applies to leadership skills, motivation, strategy use, etc. If the correct and constructive behaviour to deal with a situation is too difficult, children will learn bad strategies. Constructive behaviour should be within reach.

Discussion and conclusions

In the previous section we have looked at the group process from different perspectives. We have discussed a broad variety of smaller processes that are interdependent, and that are also parts of larger processes. We have also reflected upon how to structure these elements, so that it allows a teacher to interact with the group processes in a way that fosters growth and stimulates regulatory process in the group members.

In this section we will first discuss a model that attempts to provides such a structure. In the final remarks, we will consider the model's strengths and weaknesses, as well as its relation to other models in the literature, and lastly we will give recommendations for further research.

Presenting a model

The discussion of the processes that are part of a group assignment have shown that proper functioning of the group process is dependent upon the proper functioning of smaller processes. It is hard to have a systematic approach to a task when there is no structure in the conversation. The conversation will not be productive if there is no focus. There is no focus if the group members cannot maintain attention. One process builds upon another. Since the aim is to identify where to support weak points in the structure, and where to expand it, we will use a building as a metaphor. Our model defines four structural components of this building, and it will consider the building process, i.e. stimulating learning. The four structural components are: a developmental foundation; established techniques, habits and norms; regulating strategies; and finally reflective regulation. In table 2, we present an overview of the structure, its components, and the elements it consists of. Figure 5 offers a visual representation of the learning process. We will now discuss each component.

Reflective regulation	General reflexivity Being sensitive/observant towards arising problems in certain area's Creativity in finding or creating new solutions	Can't be co-regulated since it is complete self-regulation, but favourable conditions can be created by teacher or peers.
Regulating strategies	Applying new ways – or ways that otherwise require conscious effort – to deal with: Tasks Speech Disappointment Other emotions Difficulty Keeping focus Conversation Conflict etc.	Requires conscious effort. Should be the central focus of learning activity. Can be supported by teacher or materials.
Techniques, habits and norms.	Learned behaviour to deal with: Tasks Speech Disappointment Other emotions Difficulty Keeping focus Conversation Conflict etc.	Established and internalized. Can be consciously addressed, adjusted or expanded upon.
Developmental foundation	Capabilities and properties such as: Vocabulary Knowledge Attention span Assertiveness Emotional maturity Goal orientation Self-beliefs Context beliefs Interpersonal history etc.	Properties that have developed slowly over time. Can not be altered within activity.

Table 2. Developmental model of self-regulation, co-regulation and socially shared regulation of learning

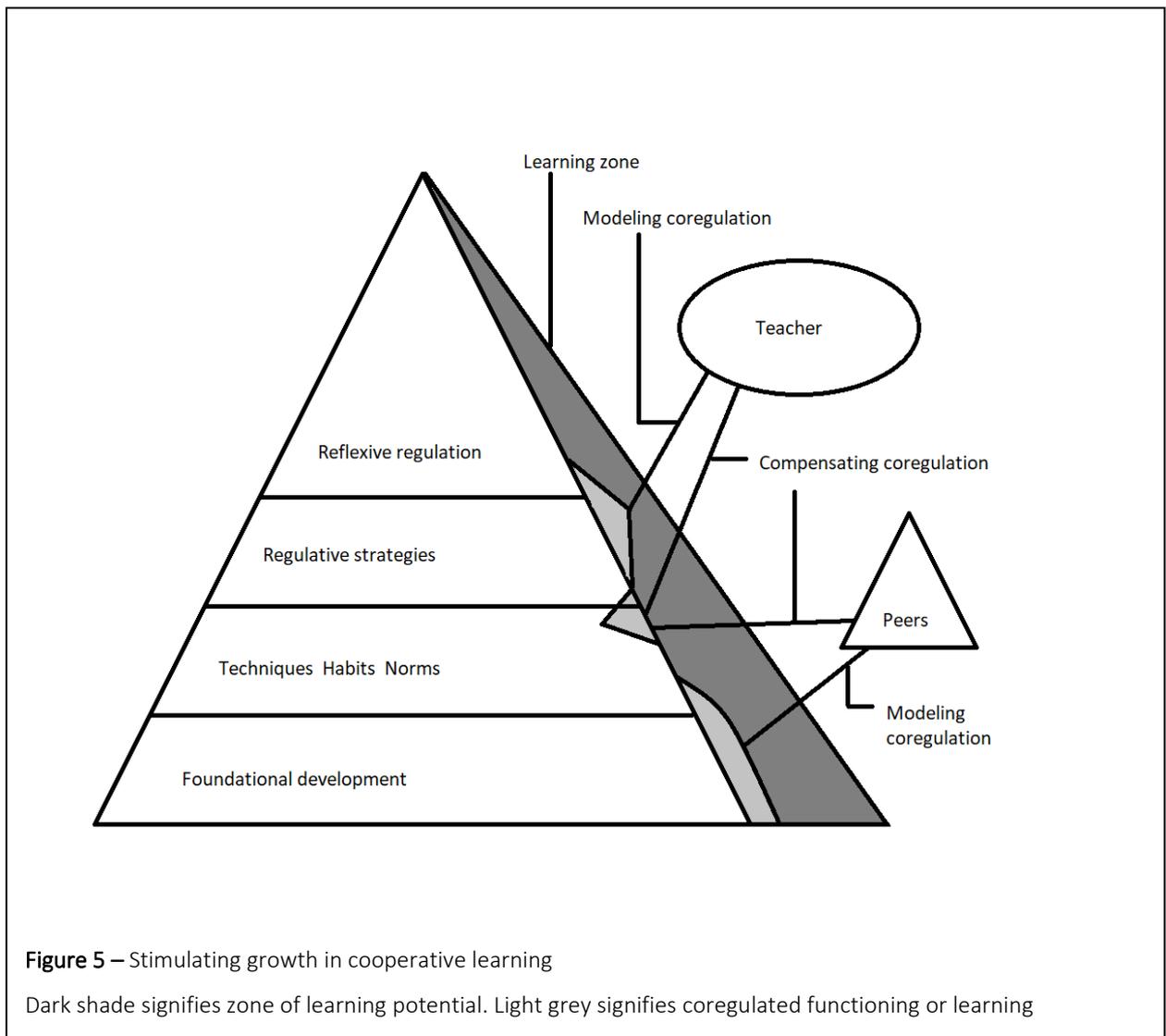


Figure 5 – Stimulating growth in cooperative learning

Dark shade signifies zone of learning potential. Light grey signifies coregulated functioning or learning

Developmental foundation. Every group process builds upon the basic capabilities of its group members. These basic capabilities are wide-ranging and numerous, and they cannot be improved upon with little effort or time. Development of capability takes time, and mostly take place outside of any immediate group activity. It is what the group will have to work with. This foundation consists of each member's vocabulary, knowledge, attention span, assertiveness, emotional maturity, self-beliefs, and goal orientation, among many other things. Although it is futile to try to improve these elements during any activity, a properly functioning group process will stimulate development in the long run.

Techniques, habits and norms. Apart from the developmental foundation, group members will have internalized previously learned ways to handle situations. Techniques, habits and norms (THN) build op the developmental foundation. Different from the developmental foundation, techniques can be learned quite quickly, habits can be departed from and norms can be addressed. An example of THN is a previously learned way to approach a specific problem. Some children may have internalized that it is important to understand an assignment well, and so they read it carefully. Other children may know this, but to them, this requires conscious effort. Another example would be the habits and norms regarding conversation or speech. If a child is not heard by others, it's habit might be to start shouting, to give up being heard or to calmly repeat. The group will also have a norm, a default, on the way to have a discussion. An individual's habit of dealing with setbacks, by giving up and doing something else, or by involving others, is an example regarding motivation.

Regulating strategies. THN's are the default way to deal with situations. Any attempt to do things a different way will require regulating strategies. By introducing and trying a new strategy, a group can greatly improve their process. This is where a teacher can very effectively intervene in a process to stimulate learning. However,

regulating strategies build upon the developmental foundation and previously learned THN. It will determine whether a regulating strategy will succeed, or whether it is not ready to be learned. For example, regulating a conversation effectively will require the leader to have a clear agenda in mind, to keep focus and to be assertive when needed. It requires the group to have polite and effective conversational norms. If these components are poorly developed, it is futile to learn children how to lead a discussion. On the other hand, a competent leader might be successful with a less developed foundation, where a less competent leader might fail.

Reflective regulation. Other than regulating strategies, reflective regulation occurs when someone observes a problem in the system it is part of, reflects upon it, and then makes an attempt to solve it. It is complete self-regulation. This means there is no co-regulation applied on the self-regulating group member. However, the strategy resulting from the reflection can be co-regulation of another member. An example would be when a group member notices that there is chaos in the conversation and takes the lead in regulating the conversation. Or when children notice other group members being stuck, not knowing what to do, and then offer a solution.

Reflective regulation is independent. However, this does not mean the teacher has no role. Teachers can set up reflective regulation by heightening children's senses around an issue. In other words, by making children aware of a problem and triggering them to act. Or in general, for example by teaching children to take a deep breath and think when what they are not doing is not working. Even though such a method can be considered a regulation strategy, or even a technique or habit, it helps build a foundation for children to reflect on their problems and deal with them constructively.

Evaluation of the model

We will evaluate the model first by discussing its strengths and weaknesses. We will then discuss how it relates to existing theories on cooperative learning and self-regulation.

Strengths and weaknesses. Glaser and Strauss (1967, p. 237) suggest that the theory resulting from the application of the grounded theory method should have at least the following four properties:

- It should closely 'fit' the area where it will be used, meaning it should not only work in theory;
- It should be readily understandable for the lay person working in the area;
- It should be general enough to be useful;
- It should give the user a degree of control over a situation.

Starting with fit, the difficulty here is that the processes involved are numerous and complex, that it is impossible not to have significant abstractions in the model. Whether it has a good fit with the classroom is hard to evaluate at this point. The model should be tested and refined in order to ensure this. However, the intent of the model is to make the user attentive to focal points that are most crucial to learning, and where the efforts of the teacher are most effectively spent. The basic structure of the model is simple and should be able to facilitate this.

Regarding understandability, we can expect any user of the model - teachers - to be quite knowledgeable with respect to education. Still, vagueness or ambiguity might be a problem for some concepts in the model. Similarly to fit, understandability problems might arise with details, but not with the basic structure, and piloting the model might help refine it. Additionally, it would be helpful to have a few illustrative example of how to apply the model.

With respect to generality, should be useful for any teacher in the higher grades of primary education, possibly also secondary education. An inherent assumption of the model is that student cannot be taught these higher level processes directly in a classroom instruction, due to the fact that they do not have enough developmental foundation to accommodate the newly learned skills. When students have developed to the point that they can be explained complex processes directly, other models might be preferred.

With regard to control, the model is uniquely designed to give the user control over a situation. However, it does require the user to have enough analytic skills and practical knowledge needed to properly diagnose where co-regulation is most needed, even though the model supports this process.

Past the criteria set by Glaser and Strauss, some other things can be said regarding the model's worth. Whereas it is very well suited to support a teaching practice, its place in the scientific endeavour to understand and define self-regulation of learning is somewhat unclear. The process of self-regulation is not clearly described and concepts are not clearly defined, making internal validation difficult. Testing whether the model can help teachers stimulate growth in self-regulation skills should not be a problem. Perhaps it could be refined to also accommodate more rigorous scientific validation.

Relation to other models. Compared to all models reviewed by Panadero (2017), that take a more cognitive and/or motivational perspective, our developmental model has a different purpose and radically different structure. The developmental model in no way replaces or improves upon existing models. In fact, it would probably good to apply one of the existing models alongside the developmental model, since one of its weaknesses is that it does not really describe the process of self-regulation. However, it would be good if the developmental model can

incorporate some of the insights provided by the other SRL-models. If there is less of a discrepancy between, this could also benefit research. The developmental model does have in common with the SSRL model by Hadwin et al., (2011) that the individual process of self-regulation and the group process of socially shared regulation are described with the same structure. The developmental model is equally applicable to individual processes as group processes.

The developmental model has a uniquely developmental perspective, and its zone of learning potential is related to Vygotsky's Zone of Proximal Development (Slavin, 2015). It adds a hierarchical structure in order to help guide and prioritize effort towards growth.

Recommendations. As discussed in the previous paragraphs, the developmental model should be accompanied with illustrative examples of how to use it in practice. Also, a useful addition to the model would be to distinguish between several areas in which self-regulation takes place, and that are relevant to cooperative learning (for example: decision-making, conversation, planning, motivation, etc.). Additionally, it could be reorganized to better align with existing literature, though not at the cost of fit, understandability, generality or control. A pilot study would be useful to improve fit and understandability, and it should show whether the model is useful in the classroom. Finally, and most importantly, a study could be done to test whether the model can actually help educators improve self-regulation and collaborative learning of students. This study should compare an intervention that uses one of the other SRL-models, with an intervention with both that same model, as well as the developmental model.

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