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## Socio-cognitive Analysis of Socratic Dialogue: A Blend of Theories

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### Abstract

Our work involves close analysis of Socratic dialogue and Paideia Seminar (Billings and Fitzgerald, 2002; Pihlgren, 2008), grounded in socio-cognitive theory. Similar to Socratic dialogue, The Paideia Seminar is defined as “a collaborative, intellectual dialogue about ideas and values, based on a text, facilitated by open-ended questions, resulting in enhanced conceptual understanding (Roberts and Billings, 2008).” By examining both quantitative and qualitative aspects of thinking in dialogue, we have found important socio-cognitive patterns. In developing systems for analysis we have identified the following important features:

- Ratio of teacher to student talk
- Content of talk
- Use of gestures and various means of non-verbal communication
- Levels of cognition

In addition, we have found a curious interpersonal cognitive processing which frequently occurs in Seminar dialogue, prompting new individual and collective thinking. This, we believe, poses an important challenge to existing theory on thinking.

### 1.0 Introduction

A growing body of literature suggests a strategic approach to measuring thinking, one that takes a *socio-cognitive* perspective. Briefly stated, a socio-cognitive view includes a “way of thinking and speaking” (Langer, 1987). It implies that we become more literate thinkers not just alone with a book or a pen but also in a social context. Indeed, Lev Vygotsky, a seminal thinker in the area of socio-cognitive theory, argued that all higher order thinking skills appear on two levels: First, on an *interpersonal* or social level, and then, and later, on an *intrapersonal* or individual level (Vygotsky, 1978). From this view, dialogue between teacher and students, and among students, is crucial in the development of broad literacy skills, as well as in the development of higher levels of thinking.

Our previous work has involved close analysis of Socratic dialogue and Paideia Seminar (Billings and Fitzgerald, 2002; Pihlgren, 2008), grounded in socio-cognitive theory. By examining both quantitative and qualitative aspects of thinking in dialogue, we have found important socio-cognitive patterns. In developing systems for analysis we have identified the following important features:

- Ratio of teacher to student talk (turns and time)
- Content of talk (textual ideas, personal connections)
- Use of gestures and various means of non-verbal communication
- Levels of cognition (recall to synthesis)

Our findings suggest correlations between Socratic dialogue practice and participants’

ability to deal with conflicting ideas. On both the individual and collective levels,

dealing with socio-cognitive *conflict*, or disagreement, helps discussants view and

digest varying perspectives, and in turn to adjust or refine their own interpretation on an

issue (Almasi 1995; Danielewicz, Roberts, and Noblit, 1996).

## **2.0 Literature Review**

## **2.1 The seminar context for supporting thinking**

The Paideia Seminar, evolving out of the work of American philosopher Mortimer



Adler (1980), is defined as “a collaborative, intellectual dialogue about ideas and

values, based on a text, facilitated by open-ended questions, resulting in enhanced

conceptual understanding” (Roberts & Billings, 2008). Similarly, Socratic dialogue

draws from a wide range of universal traditions, building critical thinking through a

collaborative examination of paradoxical issues. The traditions of Leonard Nelson

(1965) in Germany, and of Hans Larsson (1925) and Oscar Olsson (1911) in Sweden

describe a set of methodological steps to attain similar objectives (Pihlgren, 2008). This

method is here referred to as Socratic seminars. All the traditions lean heavily on



Aristotle's (1998) idea, that intellectual habits of mind can be trained, and that this

training will result in the individual attaining intellectual virtues, which will later result

in practical wisdom, i.e. to be able to make productive choices, when confronted with a

multitude of (incongruent) ideas.



The Paideia and the Socratic Seminar are a structured discussion focused on a text. By

text here we mean a tangible document or artefact, it may or may not be a print

document, it could be a work of art or a scientific diagram. The text serves as a



common reference point and should include at least two or more key ideas or concepts.



Participants are guided through a close reading of the text, often with note taking before

the formal dialogue begins. Likewise, before a Paideia and a Socratic Seminar,

participants are asked to reflect and focus on particular aspects of the dialogue process

(dialogical “virtues”, Lindström, 2000). There are commonly group and individual

participation goals (such as asking a genuine question, referring to the text, using

others' names) set.





The facilitator of a Paideia and a Socratic Seminar poses both planned and spontaneous

questions about the ideas and concepts in the text. Questions planned prior are

designed to help participants move from a fairly simple thought process to a deeper and

more sophisticated analysis.



Throughout the Paideia and Socratic Seminar dialogue, the facilitator refrains from

evaluating the comments of participants and instead nurtures a sense of comfort with



intellectual risks. The kinds of discussions that occur within the Seminar “are

characterized by having open-ended questions, using textual references to support

ideas, producing rigorous, intellectual dialogue, examining challenging and ambiguous

texts, and fostering open participation (Orellana, 2008). In this way, the Seminars work

as a process of taking participants from simple comprehension and recall, through

analysis and synthesis, finally reaching a deeper understanding of the ideas through

evaluation and creative thinking.





More specifically, the Seminar “text” is used to facilitate taking a distance from the Self,

when discussing the ideas. This tool reflects the Socratic *elenchus* as Popper (2007)

describes. The cumulative refuting interpretation is a systematic and critical analysis of

the ideas, sorting out those which do not pass the test. The adjusting part of refuting

interpretation is a result of a creative, intuitive process, where new “bold” ideas are

found and tested (Lindström, 2008). This is meant to apply both to the individual and to

the group, see figure 1.





**Intrapersonal  
thinking process**

**Interpersonal, contextual  
thinking process**

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**Cumulative  
interpretive  
Process**

Confirming and deepening OR refuting one's own idea or understanding	Group working together to find evidence and to confirm OR refute previous ideas or understandings
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**Creative  
adjustment  
interpretive  
process**

Changing one's own idea or understanding as a result of a new idea found and tested by self or other participant	Group discussion leaves previous assumption, idea or understandings and builds further dialogue on a new idea being presented and tested by some participant
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Figure 1. Intellectual process in seminar



The interpersonal and intrapersonal processes are considered interdependent: the

individual influences the group and vice versa (Pihlgren, 2007). The group actions will



gradually be internalized by the individual: The interpersonal thinking modes will teach

the individual a thinking disposition, a habit becoming a virtue and later part of character

(cf. Aristotle). This “apprenticeship” seems to suggest the group as a “master”, making

use of “multiple zones of development” (Brown 1994, Kumpulainen & Mutanen, 1999).

Someone in the group is always a bit further ahead in understanding. The dialogical

virtues, trained by group and individual participation goals, function as a promoter of

this internalization taking place by fostering an open atmosphere. The space created

must be safe for taking intellectual risks.



## **2.2 Research on specific aspects of dialogue that support thinking**

Various research explicitly links the quality of questioning in a discussion with the

intellectual quality of responses (Tobin, 1987; Nystrand 2006). In particular, a

dialogic phenomena described as “maieutic frames” uncovers more fully how

open-ended questions lead to cognitive conflicts within Paideia Seminars. Maieutic

frames provide important scaffolding to guide participants to look for answers beyond

the literal, to identify logical errors, and misinterpretations of the text. From there,

students built arguments in response to or as a rebuttal against other participants'



claims, and in so doing, they used references as either data or backings to validate their

arguments (Orellana, 2008). This dialogic event, emergent from quality questions,

requires participants to assess alternative modes of looking at ideas, to think of

hypothetical consequences, and to explore atypical causes (Orellana, 2008).



Another important aspect of dialogue revolves around the social language roles

assumed by participants. Certainly, “what the teacher does and does not do, is pivotal...

(Billings & Fitzgerald, 2002). In traditional classroom discussion, the teacher controls



the discussion and the majority of students follow suit. However, as the teacher shares

power and authority, students are invited to assume more active, even challenging roles

where the level of cognitive engagement is wider spread.



A third significant aspect of Seminar dialogue is the rules of engagement. How the

dialogue unfolds is clearly related to what participants are able to accomplish

intellectually: intellectual habits rely heavily on dialogical virtues. While playing the

seminar game, skilled participants acted as one; and participants were able to cooperate



to involve many participants (Pihlgren, 2008). Learning the rules of dialogue occurs in

three stages: 1. understanding what the seminar game is about, 2. testing the game by

focusing on the rules, and 3. focusing on the intellectual content.



These key studies on dialogue illuminate the impact of questions, socio-linguistic roles,

and cultural rules on individual and collective cognition. It can be summarized that

through these determining factors, Paideia Seminar supports “critical thinking,”

encourages “growing in understanding and integrating new ideas into your own,” it



“challenges what you think, and allows a flow of interaction from other students,

reminding us of forgotten knowledge” (Robinson, 2006).

### **3.0 Methodology**

In Sweden, 16 seminars with five to sixteen year old students were video taped over a

three year period. In the U.S. three seminars with tenth graders were video taped

during a school year.



The video tapes were transcribed, the talk turns were numbered, and gestures noted.



Then, the transcripts were analyzed by coding and sorting according to socio-linguistic

themes including questions, content of talk, and levels of thinking (Billings and

Fitzgerald, 2002). The participants' body language and group interaction were also

analyzed closely through a phenomenological approach (Pihlgren, 2008).



Our coding categories for examining the socio-cognitive aspects of classroom dialogue

are presented below.





*Table 1. Paideia seminar transcript coding matrix*

Paideia Seminar Transcript Coding Matrix					
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<u>Number</u>	<u>Source</u>	<u>Form</u>	<u>Relation</u>	<u>Cognitive Process</u>	<u>Cognitive Content</u>
	Facilitator/ Participant	Statement/ Question	Stick / Roll	Clarify Analyze Speculate Synthesize Apply Evaluate Generalize Compare Affirm	Text Self Group Other topic Others/ the world Process

Total talk turns	Ratio of teacher: student talk	Ratio of statements: questions	Popcorn  Vs  Continuity	Thinking levels	Focal point(s) Ideas Values
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Balance in participant talk; Length of turns	Who is in control/ or leading	Questions that generate additional thinking	Building on others' comments	Close analysis to inform Evaluation	Relationship to thinking levels.
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## **4.0 Results**

#### **4.1 Examples of seminar transcripts and analyzes**



Included below are four examples of seminar transcript excerpts from Swedish

classrooms. Following the transcripts we offer narrative analysis highlighting the

dialogic features related to cognitive processing. Finally, we provide a summary table

and discussion of the quantitative aspects of all four transcripts.

**Sequence 1a: Five-year-olds discussing “Pippi Longstocking”**

This sequence is filmed 2 minutes after the seminar has started and lasts for 43 seconds.

The facilitator has asked the opening question which is: would you like to have Pippi

for a friend?" A girl (Saari) has answered the opening question by saying that you



have to protect yourself against Pippi since she is the strongest girl in the world. After

that, another girl (Anita) stated that she would like to have Pippi as a friend since she is

the strongest girl in the world. There is then an interruption concerning seminar rules

from one boy (Martin). There is a cut in the transcript for 1 ½ minute and the next part

of the sequence lasts for 35 seconds. Tom has answered the opening question, saying he

agrees with Martin that he doesn't want Pippi as a friend because she is a girl.



1. Saari: I think (?) it's a good



2. Facilitator: It's good to be her friend

3. (6) */Facilitator writes on her note pad/*

4. Martin: You forgot the D in the beginning /*He leans forward, facilitator looks*

*at him and then back at her notes/*

5. Facilitator: m (.) d'you know (.) /*She looks at Martin, shakes her head, raising*

*her eyebrows/ I'm just sitting here an' making kinda jotnotes /She waves her*

*right hand, leans forward, shakes her head/ I'm not writing wholly fully just*

small (.) /*She screws her eyes up, looks towards Johanna/ scribbling (.) /*She**



*"writes" in the air, smiles. Martin puts his hands to his face, wiggles his hands*

*and puts them down/*

6. Facilitator: Martin then why (.) /*She nods, point with her pen towards Martin/*

do you think would you like her as a friend? Or wouldn't you /*She shakes her*

*head/*

7. Martin: Nope /*He puts his hands to his face, shakes his head*/

8. Facilitator: No? /*She shakes her head, writes on her note pad. Idun starts*

*“writing” on the table/*



9. Martin: Never

10. Facilitator: Never (.) why never

11. Martin: Becau:::se (.) she's a girl (↑) /*He turns towards Tom, smiles. Tom looks*

*alternately at Martin and facilitator/*

12. Facilitator: But if she was a boy then */She nods a little/*

13. Martin: ((giggles)) /*He puts his hands to his mouth*/

14. Facilitator: If it was a boy /*Anita shakes her head*/

15. Tom: No /*He shakes his head*/



16. Martin: No /*He shakes his head a little*/

17. Tom: Nope /*He shakes his head*/

18. Martin: No /*He shakes his head a little*/

19. Facilitator: No (.) okay (.) okay /*She nods and glances over the group/*



Martin breaks the seminar rules by not keeping to the subject (4). After this happens,

there is a pause of 6 seconds where the facilitator writes on her note pad and the group

is concentrated on her writing, looking at the note pad, most of them leaning forward.



Almost all glances are focused on the facilitator or her note pad during this part with

only two quick glances from Anita and Saari on Martin. The facilitator looks at Martin,

the note pad and at Johanna alternately, probably considering how to handle the

situation.



The facilitator then puts the seminar back on track with a question addressed to Martin

about whether he would have wanted Pippi as a friend. Martin seems a bit uneasy even

though his answer is a prompt no. He puts the hands to his face. When he answers that



he will not, because Pippi is a girl, he turns to Tom (11). This seems to make Tom

uneasy, he looks back and forth at the facilitator and Martin.



Here we now have the boys with opposing points of view as well as the earlier

differences stated by the girls. Both intrapersonally and interpersonally, it seems these

young children are considering various points of view while evaluating the ideas of

strength and friendship.





**Sequence 1b** (continuation of Sequence 1a, one and a half minute later):



1. Facilitator: Would you like Pippi as your friend?

2. Tom: Nope /*He shakes his head*/

3. Facilitator: No? And why not? */She writes and turns her head towards Tom.*

*Tom raises himself up in the chair/*

4. Tom: She:'sa girl (↓)

5. Facilitator: No but (.) you have friends that are girls /*Martin puts his hands to his*



*mouth/*

6. Tom: Mm sometimes yah (.) bu' not Pippi /*He leans back and puts his hand to*

*his neck/*

7. Facilitator: Not Pippi, but if she was (.) boy then /*She turns her hand to her*

*neck, Tom shakes his head/*

8. Tom: Not (.) no

9. Facilitator: But but is it really so Mart (.) eh Tom that you think so /*She smiles*

*and nods, raises her eyebrows/*



10. Tom: Yes

11. Facilitator: You who usually play a lot with the girls

12. Tom: Mm atleast instead smaller boys it doesn't matta if it's a girl or a boy /*He*

*fingers on the microphone cord/*

13. Facilitator: So it doesn't matter /*She shakes her head*/

14. Tom: Mm

15. Facilitator: Okay

16. Martin: Pippi (.) one orange 'air and (?) /*He signs braids by his ears/*



17. Johanna: Tom /*Tom turns his head towards Johanna and back*/

18. Facilitator: Yes

19. Martin: and braids standing right out

20. Johanna: TOM

21. Facilitator: but isn't that good then /*Tom turns his head to Martin and back to*

*facilitator/*

22. Tom: No

23. Martin: God no:





Tom alters his idea about why he does not want to be Pippi's pal from saying that it is

because she is a girl (4) to that it doesn't matter if she's a boy or a girl (12). This shift

in the young boy's perspective, from both a social and a cognitive viewpoint is

fascinating. Tom may be willing to take this new path because of learned confidence

with the seminar process. He has had considerably more experience with the rules of

dialogic discussion, whereas this was Martin's first seminar.





Martin, however, presents a completely new idea, that hasn't been considered in the

seminar before – that he wouldn't consider having Pippi as a friend because of her

looks (16, 19) and Tom agrees with him. These shifts and turns in a very short period

of time suggest students consideration if not, integration of new perspectives. These

adjusting ideas influence the rest of the dialogue.

**Sequence 2: Grade 1 discussing “Ronny and Julia”**

The sequence is filmed 25 minutes after the seminar has started and lasts for 1 minute

12 seconds. It is preceded by the facilitator asking if it's possible to know if someone is



anxious. One boy (Christian) has been tapping the table with his eraser. The facilitator

moves into questioning students to think about their discussion process and how they

did with their personal goals.



1. Facilitator: D'youknow Christian you're disturbing the others theyhave think

it's really to think an' /*She shakes her head. Christian stops "stamping" / (.)*

something else an' /*Christian drops his eraser into the middle of table, leans*

*over quickly and grabs it/*



2. Diana: Christia:n

3. Christian: To this here chickenpox /*All except Igor and David look at Christian*/

4. Abel: ((giggles))

5. Otilia: ((giggles))

6. Facilitator: What'ya say /*She leans forward*/

7. Christian: Heas CHICKENpox

8. Facilitator: Heas chickenpox

9. Abel: ((laughs))



10. Christian: eh have done

11. Facilitator: Can you get chickenpox 'cause you're worried /*She and Kasper*

*smiles/*

12. Abel, Nancy, Kasper, Mickan, Markus: ((laughs)) /*Otilia smiles*/

13. Kasper: Nohooo

14. Christian: The eraser has got chickenpox

15. Facilitator: The eraser has I thought it was Ronny ya meant who was all spotty

*/Nancy turns to Christian and smiles. Bella looks at the camera/*



16. Mickan: ((laughs))

17. Markus: But then maybe it can infect you

18. Facilitator: But listen if you notice that a friend is this worried or sad or

something like Ronny was what can you do then /*Kasper nods*/

19. Markus: Cheer'em up

20. Facilitator: What did'ya say

21. Markus: cheer them up can d

22. Facilitator: Cheer them up howdoyou do that



23. Markus: an' can give something orah (3)

24. Facilitator: What do you think you should give them */Facilitator writes/*

25. Markus: (1) a flower or whatever

26. Facilitator: Yea you think something a gift or something /*She shakes her head*/

27. Christian: A DRAWING /*He leans over the table with his arms out. Facilitator*

*nods once/*

28. Facilitator: A drawing whatelse can you do

29. Christian: An UGLY



30. Facilitator: An ugly drawing /*Carl looks at the camera*/

31. Nancy: That wouldn't make you glad /*She looks at Markus. Christian draws*

*back/*

32. Christian: B

33. (1)

34. Markus: If you make an ugly drawing then you just had to daub an' then you

getah /*Carl nods*/

35. Facilitator: An' that wouldn't make you glad what would you be /*She nods and*



*turns to Carl. Markus turns to David/*

36. Carl: Yea but I (?)

37. Christian: Yea but if you are */He turns to facilitator and to Markus/*

38. David: I daubed on my airplane

39. Facilitator: Some other come /*She nods*/

40. Carl: Yes /*Christian's eraser taps twice*/

41. David: Airplane /A tap is heard from Christians eraser/

42. Facilitator: Listen (.) I think we say like this (.) an' thanks very much for the



conversation /*She raises up in the chair. Nancy and Carl reaches for their*

*pieces of paper. David puts down his piece of paper and Bella grabs her piece*

*of paper with both her hands Christian drags his piece of paper towards his*

*body. Otilia stretches out her hand over the table with her piece of paper. Diana*

*puts down her piece of paper on table. Abel turns to Markus and then to Diana/*

43. Christian: Yeah

44. Diana: Now can we read out loud /*She shakes her of piece of paper in front of*

*her/*



45. Facilitator: Those who want to (.) /*She puts down her pencil and puts her hands*

*together/*

46. Diana: read out loud

47. Facilitator: can today can tell what they have /*Markus raises his hand*/

48. Carl: OOPS

49. Diana: I want to

50. Facilitator: on these notes here instead

51. Carl: Right



52. Facilitator: Otilia would you like to tell

53. Carl: That you could do

54. Abel: One doesn't have to

55. Carl: I want to /*He jumps off his chair and goes out to the left*/



The facilitator corrects Christian about his disturbing the seminar by making noise and

another student (Diana) supports this (2). Christian answers the next question by

making a joke that his eraser has chickenpox (3). Many others laugh and seem to



appreciate the joke (4, 5, 9, 11, 12) even though Bella looks at the camera (15) as if she

is worried if this is appropriate.



The facilitator then treats the utterance as if it was a new seminar idea presented by

posing a new seminar question (18). They now go on to discuss how one can help a

friend who feels worried or anxious. Christian suddenly presents an idea highly

connected to the previous seminar discussion. He suggests giving away a drawing (27)

but immediately seem to change his mind and provokes by specifying that it should be



an UGLY drawing (29). This time no one seems to think it's a joke, although at least

Carl seems aware that it is a provocation, he looks at the camera (30). The facilitator

chooses to repeat the sentence in a neutral tone (30). Nancy (31) and Markus and Carl

(34) on the other hand refute the idea in accordance with seminar practice.



There is now some confusion as to how to go on (35-41). Nancy, Markus, Carl, David

and facilitator seem to try to encourage each other to help find the way to carry on by

looking at each other but the verbal interaction is disrupted. Contrary to their usual



behaviour, someone here is looking at a person who doesn't speak and the person

speaks almost immediately after this. Nancy in 31 looks at Markus who speaks in 35,

facilitator in 35 looks at Carl who speaks in 36, Markus in 35 looks at David who

speaks in 38. The rest of the participants either look at the speaker or at their piece of

paper (except for Abel who looks alternately at Nancy and Markus). Christian is

trying to get into the interaction both by speech (32, 37) and by looking at the facilitator

and Markus (37) but with no success. The group seems to work together to correct

Christian with actions, rather than with words. They also seem to try to get the seminar



back on track after he has tried to disturb it, by using looks and gestures, encouraging

each other to speak to protect the dialogue from collapsing.



The facilitator finally ends the seminar, which causes most of the participants to touch

or move their pieces of papers with personal goals (42). Diana asks if they now can

read their notes (44) and they go on discussing the procedures for this (47-55). As in

earlier sequences of this seminar, the individual gestures and glances throughout the

seminar show that participants are concentrated on their pieces of papers with personal



goals, except when they find the verbal interaction interesting. For example Otilia, who

has been supporting the facilitator in sequence 1 a, takes up her piece of paper in turn

16 and plays with it, glancing quickly back and forth to the facilitator for the rest of the

sequence. Their gestures support the idea that they are trying to understand a new step

of the seminar – goal-setting.



There is a range of questions posed by the facilitator, including management and

coaching the social behavior for example: “D’youknow Christian... ?” (1). In



addition, the facilitator poses thoughtful, open-ended questions like “:But listen if you

notice that a friend is this worried or sad or something like Ronny was what can you do

then” (18). Cognitively, some facilitator questions take the students to application and

elaboration. “What do you think you should give them?” (24). Likewise the facilitator

asks an open and clarifying question: “Whatelse can one do?” (28).



Christian is obviously trying to disturb the seminar and the other participants. Suddenly

he lets himself be included into the dialogical interplay, by suggesting that a drawing



might be given away (27). He seems to regret this, and returns to his former strategy by

suggesting an ugly drawing (29). This, however, is treated by both the facilitator and

the other participants as a new, adjusting idea and is analyzed and refuted according to

seminar procedure (30-35). Before Christian presents the idea, the seminar is working

rather slow, one statement building on another cumulatively. This adjusting idea, even

though it is refuted, brings new life to the dialogue at the end of the seminar.

**Sequence 4: Grade 7 discussing a newspaper article on dress code**

The sequence is filmed 50 minutes after the seminar has started and lasts for 1 minute



30 seconds. It is preceded by the group discussing how school differs from working life

and Mattis refers to a recent class, stating that it is also important for young people to

know how to express themselves. After this sequence, the facilitator reviews the

discussion and they evaluate their group goal.



1. Facilitator: It's isn't it someones (.) job to inform the youngstersin is still on

their way to become grown-ups (.) it must be someones job to tell you how you

*(?) /She hits her palm with the other hand, turns to Anna A and nods. Anna A*



*turns out her hands and take them back/*

2. Anna A: Yes (.) it could be school's job but

3. Facilitator: And the home or /*She bows to one side, turns her hand out, moves*

*her hands up and down/*

4. Anna A: School should b yea but */She shakes her head/*

5. Facilitator: But not forbid is that what you're getting at /*She turns to Mattis,*

*nods/*

6. Anna A: ba exactly school should inform but not forbid /*She shakes her head,*



*turns to Jakob/*

7. Mattis: M

8. Johnny: M

9. Facilitator: M okay

10. Jakob: It think it's more the parents job it yeait yeait's sorta both and */He turns*

*to Anna À, waves his hand. Facilitator turns to Jakob and nods. Anna A shakes*

*her head/*

11. Facilitator: Yes yea



12. Anna A: yea though the parents can forbid /*She takes up her paper and turns it*

*around. Jakob starts to write or draw, facilitator turns her pen out towards him/*

13. Facilitator: If the parents don't

14. Ruben: But if the parents don't bid () uh (.) ah (.) not care so ah

15. Facilitator: If the parents don't inform then it's the task of the school is that

howit fee' /*She turns to Jakob and raises her hand towards him/*

16. Anna A: Yes the school and parents should inform but the school should not

forbid the parents should do that /*She rises her hands in front of her, shakes her*



*head, points towards her other hand, puts both hands to her mouth and shakes*

*her head. Facilitator turns down her hand and looks at Anna A/*

17. Facilitator: No yea the parents can choose that as they like /*She shakes her head*

*and turns to Anna A/*

18. Anna B: If they are /*She turns to Anna A and nods*/

19. Anna A: If they are /*She turns to facilitator and then to Anna B*/

20. Facilitator: If they are (.) exactly /*She claps, holding her hands by the side of*

*her head/*



21. Anna A: Yeah it's like this

22. Mattis: Yes but at the same time it feels like th (.) now (.) parents care about this

(.) it feels like (2) there they should have told this earlier /*Facilitator nods*/

without the teacher sorta telling /*Anna A looks at the camera*/ (.) if they /*He*

*moves his hands up and down/*

23. Facilitator: It should have been done at home and if not done at home it ought to

*/She nods/*

24. Mattis: Yes



25. Ruben: Well I think this principal seems to care about the students still although:

*/Lisa and Lucy look at the camera. Ruben shakes his head. Mattis looks at his*

*paper and then at Lisa/ (.) a a:h (.) although everyone seems to think she is sort*

(.) really evil but

26. Facilitator: M /*She nods*/

27. Mattis: M

28. Johnny: But I think she /*Mattis looks at Lisa*/

29. Ruben: look sheso wanna grade s talkin' about grades /*He looks at facilitator*



*and then at article. Jakob nods/*

30. Johnny: I think she is contradicting herself

31. Mattis: N what does silent Lisa think /*He looks at Lisa and smiles. Johnny turns*

*towards Lisa/*

32. Ruben: Really /*Lisa stops writing and turns to Mattis. Facilitator, Susanne,*

*Sofia, Ruben, Jakob, Jan turns to Lisa. Lucy looks at Lisa's paper. Mattis looks*

*at Lisa smiling. Facilitator smiles/*

33. Lisa: I think (1) wrong /*She moves her body, leans back, moves her fingers*



*trough her hair. Facilitator leans back and looks at her watch/*

34. Matti: What you think you cannot think wrong

35. Lisa: Mm yeahbu it /*She turns quickly towards Lucy*/

36. Facilitator: Let's see we really have to sto::p he:re ((laughs)) /*She leans over*

*table with her arms out and smiles. Anna A turns to facilitator and then to the*

*group, rises in chair and starts to write. Lisa turns out her hand and leans back.*

*Lucy turns to Lisa and Ruben, leans back and smiles. Sofia moves her hand*

*quickly over the table, “sweeping”. Ruben leans back and smiles. Mattis turns*



*his head to facilitator, nods and turns to Lisa. Johnny shakes his head and rises*

*in chair. Jakob turns to Mattis and then to his paper. Jan turns to his paper and*

*starts to write/draw/*

37. Mattis: Mh typical

38. Lisa: M bu what does silent ja (.) m Janne (?)

39. Mattis: What?

40. Facilitator: Janne hasn't even been invited once /*Lisa nods and Mattis smiles*/

41. Susanna: (?) */She smiles/*



42. Lisa: Jack ((giggles))

43. Facilitator: (?)

44. Mattis: yeahbut Jacky has alr hasal already beenb in invited

45. Jakob: butyou youhave to talk for yourself then

46. Susanne: ((laughs))

47. Lucy: ((laughs, giggle in talk)) (?)



Anna A, Ruben, Mattis and facilitator are the most verbally active in this sequence. In



turns 2-21 the utterances are quick and with a lot of interruptions. Anna A is pressing

her point that it's the parents' responsibility to foster the child but that school also has a

role in informing. The quick conversation seems to end in consensus, Anna A, Anna B

and the facilitator all agreeing almost simultaneously uttering the same words (18-20).

However, Ruben has earlier tried to point out that their way of reasoning might fail if

parents don't take their responsibility (14) although he expresses it vaguely. The point

is partly taken by the facilitator (15) but is lost when Anna A restates her earlier point.

Mattis however tries to elaborate Ruben's point (22) saying hesitatingly that the parents



do not seem to have taken their responsibility. Ruben points out that the principal (who

has forbidden jewellery and provoking clothes at her school) seems to act with good

intentions (25, 29). Mattis abruptly interrupts this line of reasoning by asking what

“silent Lisa” thinks (31). The question seems to surprise and offend Lisa (33), who

reacts negatively both in speech and gestures and later by imitating Mattis' wording but

direct them towards Jan, who has been silent during long parts of the seminar (38). The

rest of the participants also seem to react strongly to Mattis utterance, chiefly by

checking out how Lisa will take it by looking at her (32). He is breaking the rules, not



by asking Lisa the question, but probably by calling her “silent”, and also by

interrupting the flow of the discussion. The same thing doesn't happen when Lisa

directs the same line towards Jan. Here, the participants all look at Lisa or Mattis and

seem to take it as a joke (38). Lisa is probably not intending on commenting Jan, but is

answering Mattis. Jan looks down on his paper the article and makes no move showing

that he has even heard it. When the facilitator ends the seminar (36) the group reacts by

joking, laughing and by gesturing, there seem to be an almost simultaneous move or

shake out of the circle, as if a game is over.





Anna A, Susanne, Sofia, Ruben, Mattis and Lisa seem to look at most of the talkers

intensely during most of the sequence and so does Lucy from turn 22, whereas Anna B,

Jakob and Jan only look up from their paper around the “silent Lisa” passage and Jack

only in turn 17 and 25. Anna A looks at the camera (22) when Mattis emphasis the

word teacher, explaining that school might have an obligation and Lisa and Lucy look

at the camera (25) when Ruben is defending the principal. It seems as if they are

looking at the camera when school values are questioned or discussed. The facilitator in



this sequence looks more intensely at the participants with very few glances at the

article or the paper. When Jakob is trying to get into the discussion (10), she seems to

want to encourage him in by glances and gestures (10-15). In turn 33 she checks the

watch, almost immediately resulting in her closing the seminar.



We consider this a truly dialogic segment because of the ratio of teacher to student talk.

The actual questions posed show that the students have acquired sophisticated dialogic

skills of thoughtful, shared inquiry. The cognitive levels of this discussion are



primarily within evaluation and application. In addition, the students enjoy creative

ownership of the process as illustrated by their inclusive thinking.



The prevailing idea in the beginning of the sequence is that parents have the

responsibility for children's upbringing, not school. Ruben has earlier tried refuting this

idea, or at least elaborating it, by pointing out that this can't be the case if parents fail to

take the responsibility. Mattis is trying to incorporate this idea into the discussion,

which tends to display a cumulative group process, where Anna A, Anna B, and the



facilitator are supporting, refining, and elaborating the previously presented ideas.

Ruben makes a new attempt to challenge this cumulatively built idea, by presenting a

completely new one: that the principal is forbidding the clothes because she cares about

the students, an adjusting idea, that might have changed the line of discussion if it

hadn't been lost.



A summary of our analysis of the transcripts are shown in Table 2.





*Table 2. Transcript Summary Matrix*

	Sequence 1a	Sequence 1b	Sequence 2	Sequence 3
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<i>Total talk</i> (Talk Turns and time)	19 turns 43 seconds	23 turns 35 seconds	40 turns 62 seconds	36 turns 75 seconds
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<i>Source</i> (Talk Turns and %)	8 42%	10 43%	15 37%	12 33%
Facilitator	11	13	25	24
Students	58%	57%	63%	67%

<i>Form</i>				
Statement	14	17	27	30
Question	5	6	13	6 (2 by student)

<i>Relation</i>				
Stick	17	22	36	33
Roll	2	1	4	4

<i>Cognitive Process</i>				
Clarify Analyze Speculate	Evaluate	Apply	Analyze	Evaluate
Synthesize Apply Evaluate	Apply	Evaluate	Apply Evaluate	Apply
Generalize Compare Affirm				

<i>Cognitive Content</i> Text Self Group Other topic Others/ the world Process	Self  Group	Self	Other  Self  Other	Others/ The World  Text  Process
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*Talk and Source: Turns, Time, Teacher and Students*

Overall, there is a simple pattern across the four seminar transcripts. The ratio of

teacher to student talk time shifts with the age and experience of the group. The

teacher facilitating dialogue with the younger students must talk and coach the process

more actively. And with the older more experienced students, the teacher talks a

smaller percentage of the time, showing that the students are more capable of

controlling the discussion in a productive fashion.





*Form: Statements and Questions*

Our analysis of the talk form suggests subtle but important features. While the sequence

with the first grade students illustrates more questions, the seventh grade segment

includes two questions posed by students. Considering the importance of questioning in

the thinking process, this is an important note. That is, when we see students beginning

to ask questions to the group, we expect the thinking is moving toward more inclusion

and sophistication.





*Relation: Stick and Roll*

The continuity of discussion topic may or may not correlate with thinking levels, but

this is an interesting feature of dialogue to consider. We notice that the younger

students seem content to stick with one topic for the discussion sequence. However, the

older students tend to roll onto new topics more frequently.



*Cognitive Process and Content*



Across the transcript sequences, all students exhibited a blend of individual and

collective thinking. We must credit the seminar process, the text and the questions

with this outcome. In addition, we found patterns of increasingly broad content with the

older students.



## *Summary of Findings*

The actual sequence of events in the discussions is clearly related to increasing levels of

cognitive engagement. Across the transcript sequences, the teacher and students display



awareness to the rules of the game. This shared understanding provides a safe

environment for intellectual risk-taking, even though this environment is threatened

from time to time by participants (and the teacher). The safe environment is built and

maintained by the participants' and the seminar facilitator's use of gestures and

glances, while the critical intellectual process is supported and maintained by verbal

interaction.

## **4. 2 Towards an extended theory of group thinking and further research**

Our key findings begin with the fundamental realization that dialogic instruction, one



with a discernable, progressive shape is correlated with critical and creative thinking.



Our work, and recent research presented on the similar seminar activities, suggests a

personal thinking process contributing to what can be explained by theories of the

socio-cognitive, collective process. The Aristotelian idea of training habits of mind,

which will result in intellectual virtues and later in practical wisdom, seems to be a

similar way to look at what is going on in the seminar dialogue. In both theories the

group dialogue works as a “master” on an interpersonal level (cf. Vygotsky), showing



the individual how to cope with differing ideas, how to analyze and sort these out, and

how to choose the most productive ones and refute the others. This is later internalized

as an intrapersonal, individual skill or virtue.



However, there are two modes of “group thinking” displayed in our seminar material.

One is “cumulative”, where one statement builds on the former statements,

complementing, adding, and elaborating on the previously presented ideas. The other

one mode is “adjusting”, presenting new bold ideas, that haven’t been heard before in



the seminar. We believe that thinking gets “adjusting” instead of “cumulative” because

of some single idea of a participant. This is shown in the above referred sequences at

some specific points: Martin's idea of not wanting Pippi as a friend because of her

looks (sequence 1), Christian's idea of presenting someone with an ugly drawing

(sequence 2), and Ruben's idea that the principal is actually caring for the students by

forbidding challenging clothes and jewellery.



The Aristotelian idea does not entirely give an answer to what is happening when these



adjusting ideas occur. Neither does socio-cultural theory. Piaget (1971) introduces two

modes of thinking: accommodating (similar to the cumulative) and adjusting. His

theory implies that thinking is an internal process, with a series of developmental steps

from concrete to abstract. This is contradicted in our research, where even the young

individuals clearly learn from the group process. Socio-cultural theory, as well as

Aristotle's ideas, must be married with theories on intuition in thinking if we should be

able to interpret these “bold ideas” coming up from (almost) nowhere in the discussion.

We would have to refer to Popper (2007), Lindström (2008) and Larsson (1904), who



claim that there is an irrational and emotional element in the thinking process: creative

intuition is an active part of discovering solutions. This is a continuous process in

science, Popper states. Popper (2007) and Lindström (2008) conclude that this critical

problem solving strategy is creative and is used by artists as well as by scientists. This

comparison between the creativity of art and science is also made by Shlain (1991).



This calls for an extended theoretical approach when analysing the thinking developing

in Socratic or Paideia seminars. It's a challenge for future researchers on the Socratic



and Paideia seminars, and on similar dialogical learning activities.



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