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
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 |
| 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 |
| 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 |
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
<p>| Paideia Seminar Transcript Coding Matrix |  |  |  |</p>
<table>
<thead>
<tr>
<th><strong>Number</strong></th>
<th><strong>Source</strong></th>
<th><strong>Form</strong></th>
<th><strong>Relation</strong></th>
<th><strong>Cognitive Process</strong></th>
<th><strong>Cognitive Content</strong></th>
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<tbody>
<tr>
<td></td>
<td>Facilitator/Participant</td>
<td>Statement/Question</td>
<td>Stick / Roll</td>
<td>Clarify, Analyze, Speculate, Synthesize, Apply, Evaluate, Generalize, Compare, Affirm</td>
<td>Text, Self, Group, Other topic, Others/ the world, Process</td>
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<tr>
<td>Total talk turns</td>
<td>Ratio of teacher: student talk</td>
<td>Ratio of statements: questions</td>
<td>Popcorn Vs Continuity</td>
<td>Thinking levels</td>
<td>Focal point(s) Ideas Values</td>
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| Balance in participan
t 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 |
|---------------------|-----------------------------|---------------------------------------------|-----------------------------|----------------------------------|-------------------------------|

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 1½ 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 /\textit{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, wriggles 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: Because 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 frieds 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’you know Christian you’re disturbing the others they have 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: Christian
3. Christian: To thishere 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
12. Abel, Nancy, Kasper, Mickan, Markus: ((laughs)) /Otilia smiles/
13. Kasper: Nohoo
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 how do you do that
23. Markus: an’ can give something orah (3)
24. Facilitator: What do you think you should give then /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 what else 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
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: Yeaah
44. Diana: Now can we read out loud /She shakes her of piece of paper in front of
her/
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 then?” (24). Likewise the facilitator
asks an open and clarifying question: “What else 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 someone (.) job to inform the youngsters in is still on
their way to become grown-ups. It must be someone's 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/
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 À 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
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 stop here ((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 (?)
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: yeah but Jacky has alr hasal already beenb in invited
45. Jakob: but you have 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
<p>| Sequence 1a | Sequence 1b | Sequence 2 | Sequence 3 |</p>
<table>
<thead>
<tr>
<th>Total talk (Talk Turns and time)</th>
<th>19 turns 43 seconds</th>
<th>23 turns 35 seconds</th>
<th>40 turns 62 seconds</th>
<th>36 turns 75 seconds</th>
</tr>
</thead>
</table>


<table>
<thead>
<tr>
<th>Source (Talk Turns and %)</th>
<th>8</th>
<th>10</th>
<th>15</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitator</td>
<td>42%</td>
<td>43%</td>
<td>37%</td>
<td>33%</td>
</tr>
<tr>
<td>Students</td>
<td>11</td>
<td>13</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>58%</td>
<td>57%</td>
<td>63%</td>
<td>67%</td>
</tr>
<tr>
<td>Form</td>
<td>Statement</td>
<td>Question</td>
<td>Question</td>
<td>Question</td>
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</tr>
<tr>
<td></td>
<td>14</td>
<td>17</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2 by student)</td>
</tr>
<tr>
<td>Relation</td>
<td>Stick</td>
<td>Roll</td>
<td></td>
<td></td>
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<tr>
<td>----------</td>
<td>-------</td>
<td>------</td>
<td></td>
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<tr>
<td></td>
<td>17</td>
<td>2</td>
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<tr>
<td></td>
<td>33</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>Cognitive Process</td>
<td>Evaluate</td>
<td>Apply</td>
<td>Evaluate</td>
<td>Analyze</td>
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<td>-------------------</td>
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<tr>
<td>Clarify</td>
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<tr>
<td>Analyze</td>
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<tr>
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<tr>
<td>Cognitive Content</td>
<td>Self</td>
<td>Self</td>
<td>Other</td>
<td>Others/ The World</td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>------------------</td>
</tr>
<tr>
<td>Text</td>
<td>Group</td>
<td></td>
<td>Self</td>
<td>Text</td>
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<tr>
<td>Self</td>
<td></td>
<td>Self</td>
<td>Self</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Other topic</td>
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<td></td>
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<tr>
<td>Others/ the world</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Process</td>
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</table>
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 resent 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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