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Close collaboration, dialogical thinking and affective regulation

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Abstract. I present aspects of a process model of close collaboration, relating types of dialogical thinking (extensional, accumulative, foundational, interpretative) to the interactive circulation and regulation of affect, conceptualised as tension-relaxation.

1 Purpose

The purpose of this paper is to explore two aspects or 'qualities' of collaborative dialogue and their interrelations: the processes of dialogical thinking, viewed epistemically, and the regulation of the interactive circulation of affect. This exploration is based on previous work on knowledge negotiation (e.g. Baker, 1994), forms of cooperation (Baker, 2002), argumentative interactions and the co-construction of knowledge (e.g. Baker, 1999) and the role of affect in argumentative interaction (Andriessen, Baker & van der Puil, *in press*). The working hypothesis is that important qualities of collaboration processes are situated in the interplay between the ways that people think together in dialogue and how they communicate affects.

The notion of "quality" of collaboration can be understood in terms of the combinations of two dimensions: process/product, and descriptive/normative. Thus, the work of Meier, Spada and Rummel (2007) is normative with respect to both collaboration processes and their products (learning outcomes): good collaboration is that which leads to good learning outcomes. Burkhardt et al. (2009) propose a descriptive model of the quality of collaboration, and show how it varies with characteristics of technology mediation.

I consider collaboration *processes* in *descriptive* terms, with respect to their *potentialities* (rather than outcomes) associated with certain types of dialogical thinking: collaborators may collaborate in a 'close' way without necessarily being efficient with respect to outcomes; they may elaborate new ideas during the collaboration process, that can then be integrated into that process, or learn something incidentally that can not necessarily be apprehended in terms of outcomes of prescribed tasks.

2 Close collaboration

I want to try to sketch out a concept of *closeness* in collaboration that is a property of that process irrespective of its outcomes, in the way that one might say that a football game had been a 'good game' even though no goals were scored. A family of reasons for being interested in quality of collaboration relate essentially to trying to understand what ways of working together lead to better outcomes (e.g. better learning, better problem solutions). By concentrating on collaboration as a process, I am consciously emphasising the creativity of dialogue, its possibility of surprising its participants and observers with respect to the ideas that emerge from it, which is important, for example, in the study of innovation.

In *Phenomenology of Perception* (1945), Merleau-Ponty wrote the following:

> "In the experience of dialogue, a common ground is created between the other and myself, my thinking and the other's are woven into only one cloth, my remarks and those of the interlocutor are called forth by the state of the discussion, they are part of a common operation of which none of us is the creator."
>
> (Merleau-Ponty, 1945, p. 407 [my translation])

Whilst being distinct, dialogue and collaboration depend on each other: collaborating in the achievement of a task usually requires dialogue; dialogue presupposes collaboration in elaborating shared interpretations. I would like to say that what Merleau-Ponty (*ibid*.) writes of dialogue, elevated to the status of an ideal, is also relevant to collaboration. From the participants' points of view, a close collaboration would be associated with such a free-floating shared and personal experience, integrating affective and ideational aspects. Close collaboration is fusion of persons' ideas and selves such that the experience of not knowing who proposed what creative idea is seen in a positive way. The outside observer, researcher, can try to apprehend this, I propose, by trying to analyse the different ways that ideas are co-created, and how such processes relate to the way that affects (anger, (dis)pleasure, boredom, excitement, …) circulate and are regulated in the interaction. That is the approach I want to sketch out here. I shall frame this in terms of types of dialogical thinking, and processes of tension-relaxation in interaction.

3 Dialogical thinking, knowledge co-elaboration

On the most general level, across a wide variety of research approaches, collaborative activity can be understood in terms of three main gradual dimensions (Baker, 2002): (a)symmetry of roles adopted with respect to task elements and collaboration management, degree of (dis)agreement, and degree of alignment (of coordinated actions, problem stages, representations of the problem or "grounding). The articulation of roles is a way of describing patterns of contribution or participation; (dis)agreement relates to consensus building, knowledge co-construction and argumentation dialogue. But these general

analytical dimensions do not describe the processes of collaboration themselves, where collaboration is understood as "co-elaboration" or 'working out ideas together' ("*co*"- together; "*e*"-out; *labore* - work).

In previous work (e.g. Baker, 1994; Mephu-Nguifo, Baker & Dillenbourg, 1999), I described knowledge co-elaboration processes in terms of types of cognitive-linguistic operations, or ways of doing cognitive work with language exchanged in dialogue. There are four main classes of such operations: (1) generalisation—specialisation (exploring degree of generality of application of classes); (2) additive—subtractive (conjoining, agglomerating or else subtracting propositions); (3) foundational (arguments, justifications, verifications, explanations); and language-meaning based (repetitions, reformulations, negotiation of meaning). Operations can be applied by speakers within their own interventions, or else to the interventions of their interlocutors (or rather, to the contexts for interpretation created by utterances). One quality of collaboration *on a purely epistemic plane* thus concerns the degree to which cognitive-linguistic operations are applied to others' ideas/utterances (more collaborative/dialogical), or else to a speaker's own utterances (less collaborative, more monological).

With Allwood (1997), I consider dialogue as a form of collective thinking that goes beyond the sum of individuals' expressed thoughts, and that it can be analysed in terms of the dominant types of cognitive-linguistic operations that are mobilised in specific dialogue sequences. I thus define four major types of dialogical thinking as shown in Table I below.

Dialogical thinking	*Definition, cognitive-linguistic operators*
Extensional	Generalising or restricting scope (∀, ∃, ι), defining set inclusion of propositions; giving specific examples or instances
Cumulative	Conjoining, agglomerating, synthesizing, making inferences from propositions, exploring other alternatives (disjunction)
Foundational	Expressing (counter-)arguing, justifying, explaining, verifying
Interpretative	Repeating, reformulating, defining, negotiating meaning

Table I. Dialogical thinking and cognitive-linguistic operators.

These categories of dialogical thinking can be compared with Allwood's (*ibid*., p. 6) alternative categorisation (argumentative, consensus oriented, emotional, subconscious collective thinking), closely associated with dialogue types, and also with Mercer's (1995) categories of "talk", as "exploratory", "accumulative", "disputational", etc. Contrary to these authors, I do not identify dialogue types with types of dialogical thinking, since, in my own view, dialogue types always involve a combination of such types of thinking, notably in the case of interpretative thinking (ubiquitous in all communicative interactions) and also in argumentation dialogue, discussed below. Neither do I consider "emotional" as a type of thinking as such (*pace* Allwood, ibid.), given that it is associated with all thinking, action and perception, whether individual or dialogical (also see below).

One dialogue type that is particularly associated with negative affect is argumentation dialogue (cf. work on socio-cognitive conflict, such as Doise & Mugny, 1981), although, as discussed below, it always also involves other types of dialogical thinking.

4 Argumentation dialogue

From a pragma-dialectical point of view (Barth & Krabbe, 1982; van Eemeren & Grootendorst, 1984), argumentation is a dialogue game, with usually implicit rules (e.g. you must defend against an attack; you may not repeat attacks or defenses) aiming at resolving a conflict of avowed opinions (there can be a variety of simple or mixed conflict situations, according to the number of theses and degrees of commitment).

Such a purely dialectical vision would correspond to purely foundational thinking. But in (human) reality, such dialogues almost always also involve the other three types, relating to specific dialectical and rhetorical processes (e.g. Baker, 1999). Foundational-argumentative thinking can also be associated with: (i) extensional thinking, via argument by dissociation ("you are right for class C, but it must be split into C' and C'', and I am right in the latter case"); (ii) cumulative thinking: accumulation of concessions, consensus building as argumentative resolution, making inferences to refute by internal contradiction; (iii) interpretative thinking: deepening the theses debated, redefining underlying notions. Such discursive movements, particularly stimulated by interactive pressures relating to disagreement, can be seen as important manifestations of the *creativity* of dialogue. Argumentation dialogue can, in specific cases, thus be a particularly 'close' form of collaboration, given such creativity. In this case, the role of affect is also particularly salient, as discussed below.

5 Tension-relaxation regulation in dialogue

People who work together over a series of sessions develop what has been termed a "collaborative working relation" (Andriessen, Baker & van der Puil, *in press*), as they develop more extensive mutual knowledge and ability to coordinate. A further aspect of this is regulation of affects, which we (*ibid*.) have analysed in terms of the concept of "tension-relaxation" (cf. Bales, 1950). Thus, for example, verbal conflicts and refusals to accept proposals generally raise tension; humour and acceptance generally lower it (although the effects of such communicative actions are highly contextual: humour in the middle of a bitter highly-charged conflict might raise rather than lower tension!).

Muntig and Turnbull (1998) showed experimentally that affect enters into the very heart of argumentation dialogue, in the guise of the choice of defensive

strategy: the greater the degree of aggressiveness of an argumentative attack (n.b. the most aggressive is to claim non-relevance), the more likely it is that the proponent will choose to defend his own thesis (and thereby, 'himself'), rather than to counter-attack. In other words, explaining the way that a debate unfolds requires taking affect and facework into account. We applied a set of tension-relaxation analysis categories to a debate, and compared the variations in it with the extent to which the debate was deepened (i.e. chaining arguments on arguments). This is important given that the deeper the conflict, the more it is potentially face-threatening (Brown & Levinson, 1987) and problematic for the collaborative working relation. We found that tension, following a particular verbal conflict, tended to 'lag' behind the debate; it could take time to subside to relaxation, such that successive debate phases began at a higher tension threshold and were more emotionally charged than they 'should have' been. Although it is thus clear that there are close relations between affective regulation and argumentation dialogue, these relations appear to be highly contextual.

6 Examples

Tables II and III) show extracts from a dialogue collected in a physics classroom; the students (A and B) are 16-17 years old. Their task is to find an equation to represent the properties of balls of different substances (steel, wood, rubber) and sizes that explains their rebound behaviours when they released from the same height (the coefficient of restitution). The examples are presented to illustrate types of dialogical thinking and their relations to tension-relaxation.

Line N	*Loc*	*Dialogue*
56	A	But there there's a soft impact … so that since it's a soft impact … kinetic energy is not conserved … you see I learned my lesson … but … one can already notice that it rebounds higher than we released it
57	B	Well yes but that's necessarily so with the friction, so errr it's not negligible
58	A	Yes well in the end there's a loss yeah there's a loss at impact but we can still…
59	B	as substance … constituant?
60	A	Well right there there's a total loss of speed with means that
61	B	Wait, wait, with their interaction with the ground
62	A	so there the ground absorbs errr
63	B	yes
64	A	absorbs the impact
65	B	yes, it's an errrr soft impact

Table II. Extract 1: cumulative dialogical thinking with low tension.

This first extract (Table II) manifests predominantly cumulative dialogical thinking, in the form of inferences that take the problem solution forward ("since soft impact ➔ kinetic energy not conserved") and the addition of properties (predicates and their arguments) of the object to be explained, with a relatively symmetrical form of cooperation (A: absorbs(ground, _) ==> A: absorbs(ground,

impact) ==> B: soft(impact)). Some retroactive foundational thinking takes place, to give validating justifications for the solution under elaboration (line 57). There is no obvious inter-relational tension here, except, perhaps, for the impatience or eagerness shown by B in line 61 ("wait, wait …") who wants to follow the line of thinking with respect to friction.

Line N	*Loc*	*Dialogue*
89	A	look, concerning masses, look, one can see that the steel one is … is heavier
90	B	But it's not a matter of mass
91	A	Well there's potential energy involved, I'm sorry! ((*pause 3 seconds*))
92	B	... ok but if you have ...
93	A	If we have ... ?
94	B	If you had a big steel ball … it would rebound…
95	A	And if we release them at the same height, one with a greater mass than the other, the one with the greater mass would have greater potential energy…
96	B	Yes but
97	A	So there would be more
98	B	Do you think that if … if you had an enormous rubber ball like that, that was a kilogram, you think it would rebound a lot?
99	A	Yes, but that's only valid in the case of an elastic impact
100	B	umm
101	A	well, I think …
102	B	We'd maybe be better off thinking about that since theoretically it's more simple, given that it's a soft impact
103	A	Err yes there is … precisely ((*laughs*))

Table III. Extract 2: foundational dialogical thinking with tension-relaxation.

This second extract is primarily foundational dialogical thinking, associated with argumentation dialogue, beginning from a conflict of avowed opinions according to whether higher mass of a ball does or does not explain its rebounding higher, for which a pro argument is the presence of "m, mass" in the potential energy equation, and a counter-argument is an appeal to intuition, a thought experiment (a very heavy rubber ball would not, it is claimed, rebound much). Interestingly, this verbal conflict is 'dissolved' by some extensional thinking: dividing the universe of discourse and validity into elastic vs. inelastic impacts. There appears to be some increase in tension at the beginning, when A (line 91) defends her view quite adamantly. Yet it is perhaps a sign of the close interpersonal relation between the girls that they were able to quickly dissipate this tension once agreement was reached on the dissolving of the disagreement (the laughter in line 103).

7 Concluding reflexions

I have proposed that the emergence of creative ideas from dialogue and collaboration can be understood in terms of types of dialogical thinking. Since all thinking (perception, action) and social encounters involve an affective dimension, collaboration can be seen as involving a qualitatively different personal and shared

experience to working alone (Crook, 1994). The complex relations between affective regulation and types of dialogical thinking depend, at least in part, on the specific combinations of the latter in specific dialogue sequences, and notably on the presence or not of a verbal conflict situation.

What appears to be important in determining the affect/dialogical thinking relations are the *individual and shared goals* of the dialogue type within which they occur, and the existence or not of *conflicting goals*. No type of dialogical thinking appears to be either *necessarily* tension-raising or relaxing in itself, although, as discussed above, affective regulation can influence the type of thinking that occurs in argumentation dialogue. Foundational thinking is not necessarily tension-raising, since explanations and arguments can be produced with a view to cooperatively examining alternative solutions, building consensus (accumulative thinking), just as much as with the goals of winning, refuting, humiliating or claiming intellectual superiority/worth (Walton, 1989). Similar remarks can be made with respect to interpretative thinking: although refining or deepening understanding of the thesis being debated could be mutually experienced as 'constructive' (tension-lowering), with adversarial goals it could also be experienced as an attempt to avoid the issue or to abusively redefine concepts for individual ends (tension-raising). Only accumulative dialogical thinking appears to be special in this respect: it involves making inferences, elaborating proposals, brainstorming alternatives, and consensus-building, which all seem to be irenic or tension-lowering. Yet it is even possible in this case to envisage conflicting interests, where one participant wants to focus discussion on a particular proposal, and experiences the multiplication of alternatives as an annoying digression. And of course, inferences can be made from others' proposals in order to show that they lead to absurdities.

Only two aspects or qualities of collaborative activity have been discussed here, to the exclusion of many others, such as those relating to action coordination and temporality, or "fluidity" of collaboration (Burkhardt et al., 2009). Nevertheless, many of the qualities of collaboration studied with respect to normative evaluation of outcomes are herein reconceptualised, such as "consensus-building", "conflict resolution", and "grounding" (as part of interpretative dialogical thinking). Further work in this direction will aim at pursuing empirical study of relations between types of dialogical thinking in relation to affective regulation, within specific collaborative activities.

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