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Influence of Collaborative Reasoning discussions on metadiscourse in children's essays

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Abstract: Metadiscourse has been conceptualized as a means to organize discourse, convey interpersonal and evaluative meanings, as well as engage the reader or listener. Importantly, metadiscourse has been theorized to uncover thought mediation during the essay-composing process. This study compares the metadiscourse in the reflective essays of 180 fifth graders, who either participated in small-group discussions using an approach called Collaborative Reasoning (CR), or who did not. Comparative analysis involving six major categories and forty subcategories of metadiscourse revealed, among other findings, that CR-exposed writers better signaled illocutionary force of reasoning, made greater use of engagement imperatives/directives and common-good rather than self-centered attitude marking. CR writers organized their ideas in a more argument-befitting logical-temporal non-list-like structure. Control students made greater use of emphatics, more often introduced hypothetical scenarios, and more frequently linked propositions together with simple additive conjunctions. The findings suggest that CR students have greater concern for how readers will take their arguments and greater appropriation of argument-enhancing formal elements, thus revealing cross-modal transfer from oral to written discourse.

Keywords: metadiscourse, argumentation, classroom discussion, collaborative reasoning, children's writing, rhetoric

1 Introduction

The goal of the research described in this paper was to explore the development of *metadiscourse* in the writing of elementary school children. Speakers and writers use metadiscourse to guide, caution, and implore their audiences.

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Metadiscourse is a term for self-reflective expressions that help speakers and writers negotiate interactional meanings, assist in expressing viewpoints, promote engagement with their audience (Hyland 2005), or convey attitudes towards propositions (Vande Kopple 1985). Metadiscourse thus embraces textual and interpersonal phenomena.

Evaluative metadiscourse, or discourse-reflexive expressions, such as “The point is” and “That’s a good question”, play an important role in organizing ongoing and evolving discourse (Ädel and Mauranen 2010; Mauranen 2001). Research suggests that effective metadiscourse results in more transparent organization of discourse and greater global, local, and thematic coherence (Almasi et al. 2001); greater metacognitive awareness (Almasi et al. 2001); better learning from text (Meyer 1975; Britton et al. 1982); greater rhetorical force of arguments (Reznitskaya et al. 2001); and enhanced social performance and attitude (Crismore 1985).

The need for classroom practices that promote high-level comprehension is evident in light of findings from the National Assessment of Educational Progress (NAEP), which for the year 2005 revealed that less than 7% of fifth graders in the United States were able to “judge texts critically [...] and explain their judgments [...] make generalizations about the point of a story and extend its meaning by integrating personal experience and other readings” (US Department of Education and National Assessment Governing Board 2006: 24). High-level comprehension requires classroom practices that involve “knowledge-building discourse” in order to foster transformational thought (Scardamalia and Bereiter 1994) and “quality talk about text” that promotes thinking, learning, and language (Wilkinson et al. 2009).

The logic of the present study was to compare the metadiscourse in the essays of children who participated in a series of Collaborative Reasoning discussions (Clark et al. 2003), a type of discussion expected to promote aspects of metadiscourse, with the metadiscourse of comparable children who did not have this experience. Engaging diverse individuals who likely have different perspectives on what is right and wrong, what is credible or not, in collaborative discussions may impact students’ thought mediation when writing. Bearing in mind that writing is generally conceived as a tool for reflection, the analysis of metadiscourse in essays may open a window onto the mental tools children employ in the act of reflective writing.

Considering the paucity of studies of children’s metadiscourse, with the meritorious exception of the analysis of teacher- and peer-initiated meta-talk by Almasi et al. (2001), the study of children’s writing may break fresh ground in examining thought mediation during the essay-composing process. Therefore, the present study explores the influence of participating in Collaborative Reasoning (CR) discussions on students’ use of metadiscourse in interplay with the discourse proper in their reflective essays.

2 Theoretical and pedagogic frameworks

The rationale for the study of children's metadiscourse gains credence from the hypothesis of *bidirectionality of interaction* between cognitive processes and discourse formation and, likewise, the examination of processes in both directions – from mind to discourse and from discourse to the mind (Billig 2003).

The Vygotskian (1986) view that writing is a psychological tool that mediates thought undergirds this study's major premise that metadiscourse, as used by the fifth-grade students in their reflective essays, is *thought mediation* during a composing process, which apart from being a cognitive process is a sociocultural act and a rhetorical act in social action (after Crismore 1985). Metadiscourse is prevalent in argumentation, as while arguing cases for or against a position, "authors refer quite frequently to the state of the argument, to the reader's understanding of it, or the author's understanding of his own argument" (Crismore 1985: 61).

In Collaborative Reasoning, students read a story addressing a "big question," then meet in small, heterogeneous discussion groups in which they are expected to take a position on the big question, present reasons, back reasons with evidence and further reasoning, challenge each other when they disagree, weigh reasons and evidence, and change positions when warranted. Students operate the discussion as independently as possible, with the teacher sitting outside the group, coaching from the side. Children are expected to manage participation, inviting others to speak, not interrupting and responding to the idea/argument rather than the person. End-of-discussion debriefings expand children's metalinguistic repertoire in assessment of own and others' talk. Literature for CR discussions is selected to interest children, to raise questions of general significance, and importantly to provoke controversy.

Practice in the use of "argument stratagems" during Collaborative Reasoning promotes use of at least the rudimentary elements of an argument with its two indispensable components: *justification* for how a position was taken and the *anticipation* of a possible criticism to come (Guillem 2009). Typical Collaborative Reasoning discussions consist of repeated patterns of argument elements: statements of position, supporting reasons, counterarguments, and rebuttals (Anderson et al. 2001).

Participation in Collaborative Reasoning discussions has been documented to enhance students' "argument schema," or overall sense of a sound argument, which enables transfer to other situations and modalities (Reznitskaya et al. 2009). Children who have participated in CR discussions write essays that have better developed arguments, counterarguments and rebuttals, more consideration of opposing perspectives, and more use of text evidence (Reznitskaya et al. 2009; Zhang et al. 2013). However, it needs to be stressed that even after CR discussions,

children's arguments continue to contain vague referring expressions, sometimes do not contain explicit conclusions, and frequently are missing explicit warrants to authorize conclusions (Anderson et al. 1997). An important role for the teacher is to prompt children for greater elaboration, argument clarity, and completeness (Latawiec et al. 2015; Lin et al. 2015).

Of course, children are not a homogenous group. They differ in many ways implicated in language and thought. Notably, there are differences in the ways males and females communicate, as in Tannen's (1991) distinction between women's "rapport-talk" and men's "report-talk"; Lakoff's (1975) claim of women's powerless language and social position; or Maltz and Borker's (1982) conception of gendered norms of communication. Likewise, there is theorizing about "gendered literacy" (Millard 1997; Moss 2007).

Boys tend to perform worse than girls on writing tasks, as documented in the NAEP writing report for eighth graders (National Center for Education Statistics 2012). Contributing factors are boys' problems with handwriting and the mechanics of writing (Peterson 2006; Ziviani 1996). In an extensive investigation of nine-year-olds' compositions in the United Kingdom, with a focus on cross-gender and genre differences, Beard and Burrell (2010) found that boys' under-attainment in persuasive writing was less pronounced than in narrative writing. In persuasive descriptions (advertisement of a new snack product), boys outperformed girls in the text-level features of "opening paragraph to establish persuasive purpose," "tempting descriptions of the benefits of the product," and "content included to impress audience," while girls showed "better organization of paragraphs." In a repeated test at age ten, there were no significant between-gender differences in persuasive writing. Although more of the highest attaining children were girls across both genres and years of schooling, there were no overall gender differences in textual effectiveness, content, or language use, with the exception that girls wrote longer narratives when nine-year-olds but not when ten-year-olds.

By extension of systemic functionalism (Halliday 1994), the present study distinguishes metadiscourse – performing either *interpersonal* or *textual* functions – from the propositional/referential material or discourse proper – performing the *ideational* function (linguistic representation of experience and ideas). According to Halliday (1994), the textual meta-function plays an "enabling role" in relation to the other kinds of meaning – "the ideational or reflective and the interpersonal or active" (Halliday 1994: xiii). Importantly, meta-functions "do not operate independently and discretely but are expressed simultaneously in every utterance" (Hyland 2005: 26).

Metadiscourse with its semiotic structure (Crismore 1985) that takes into account the author, the reader, and the subject matter is conceived as the

forum for interaction in the text (Hyland 2005), and/or discourse reflexivity (see Jakobson [1980] for views on the capacity of language to refer to itself), which linearly and hierarchically organizes the discourse-flow in Mauranen's (2003) perspective, or Adel and Mauranen's (2010), though their system excludes connectives or hedges. In interactive views, the interplay between the writer, imagined reader, and content is stressed (cf. Hyland 2005). Both personal and shared aspects of cognition are believed to play a role in the production and understanding of discourse (Van Dijk and Kinstch 1983), and so by extension, in metadiscourse.

Among the well-developed systems of written metadiscourse analysis are those of Crismore (1985), Crismore et al. (1993), Hyland (2005), Vande Kopple (1985, 1997), and Williams (1981). Meyer's (1975) system of signaling devices may be seen as metadiscourse, because Meyer defined "signaling as a *non-content aspect* of the semantic content or which points out aspects of the structure of the content" (Crismore 1985: 64–65). According to Crismore (1985: 61), metadiscourse is used "in any discourse where ideas are filtered through a concern with how the reader will take them." Vande Kopple's (1997: 1) position that metadiscourse "defined as discourse that people use not to expand referential material but to help readers connect, organize, interpret, evaluate, and develop attitudes toward the material" largely aligns with our position adopted in this study, and from which we will follow with the analysis of the multiple metadiscoursal functions in children's texts (as elucidated in the coding scheme, Section 3.2.1).

A discussion of metadiscourse would not be complete without a hint of the equivocal benefits of metadiscourse (e. g. Swales 2001). In either oral or written language, metadiscourse has often been viewed as the source of "wordiness" (Williams 1981) or "content-less" discourse. Oddly enough, metadiscourse has been largely neglected in writing instruction as teachers focus instead on content (Hyland 2005). According to Mauranen (1993: 1–2), there has been a "lack of awareness of these [meta-discursive] textual features, or the underlying rhetorical practice [...] in part due to the fact that text linguistic features have not been the focus of traditional language teaching at schools."

For all of the foregoing considerations, this study compared the metadiscourse used in reflective essays by CR-exposed students and comparable controls to determine (i) whether there were differences in patterns of metadiscourse as a function of participating in collaborative discussions; (ii) whether differences in the use of metadiscourse accounted for variation in the articulation of ideas and management of written discourse; (iii) whether metadiscourse patterns used by CR-exposed students added to audience appropriateness and appeal; and (iv) whether metadiscourse patterns varied according to gender and other characteristics of the children.

3 Method

3.1 Participants

Participants were enrolled in six experimental and four control classrooms, matched in SES, from three schools in one rural area and two urban areas in the mid-western United States. There were 180 fourth-grade students, 107 CR-exposed and 73 control (Non-CR) students. In terms of ethnic background, the sample consisted of 33 % African-Americans in CR and 35.5 % in Non-CR, 3 % Latin-Americans, 1 % Asian-Americans, and the remaining European-Americans equally distributed between CR and Non-CR.

The ten collaborating teachers participated in training in which they watched videos of CR discussions and practiced using instructional moves (Clark et al. 2003). CR discussion groups were formed so that each represented the range of talkativeness, gender, ethnicity, and reading proficiency within the classrooms.

3.2 Procedures

Prior to the CR intervention, students, who provided informed consent, were given a battery of tests, including the Metropolitan Achievement Test (MAT), on which experimental and control classes did not differ. Following ten sessions (five weeks) of small-group CR discussions in the experimental classrooms, both the experimental and control students read *The Pinewood Derby* (McNurlen 1998) about Thomas, who won a model car-race, but broke the rules because his brother made his car. He confides this secret to his classmate, Jack, who has worked hard on his own car and doesn't think cheating is right, but he is reluctant to be a tattletale. Students had 45 minutes to write an essay answering the question, "Should Jack tell on Thomas?" *The Pinewood Derby* had not been previously read or discussed by any of the students.

3.2.1 Coding metadiscourse in children's essays

Essays were coded blind-to-condition employing the classification of metadiscourse shown in Figure 1. The qualitative research software Nvivo 8 was used for coding. Essays were also screened manually to verify function in context and to check features not represented in the electronic representation of the essays, for

I. TEXTUAL METADISOURSE (shows how textual elements relate to one another)

1. Text Connectives
 - Announcements of Material
 - Reminders of Material
 - Sequencers
 - Topicalizers
 - Logical-Temporal Connectives
 - Additives
 - Contrastives
 - Causatives
 - If-conditionals
 - Non-Canonical “So”
 - Miscellaneous
2. Code glosses
 - Definitions
 - Explanations

II. INTERPERSONAL METADISOURSE (conveys interpersonal meanings)

3. Illocution Markers
 - Speech Acts
 - Boosters
 - Mitigators
4. Epistemology Markers – Modality
 - Hedges
 - Morphological
 - Modal Verbs
 - Adverbs
 - Lexical Verbs
 - Other Cautious Elements
 - Emphatics
 - Forefronting
 - Repetition
 - Orthographic/Punctuation

Epistemology Markers – Evidentials

 - Personal belief
 - Induction
 - Sensory Experience
 - From Someone Else
 - If/since ..., then
 - What if
 - Deducing: Others in Scenario
 - Deducing: Myself in Scenario
 - A posteriori/Retroduction
5. Attitude Markers
 - Explicit Attitude Markers
 - Implicit Attitude Markers
 - Deontic Modality Markers
6. Commentary

Figure 1: Taxonomy of metadiscourse categories.

example, typographic markers. To check coding reliability, 20% of the essays were independently coded by another trained researcher, which yielded 95% inter-rater agreement.

The taxonomy of metadiscourse was inspired by Vande Kopple (1985, 1997) and Crismore (1985), Crismore et al. (1993), and adapted to accommodate children's metadiscourse. Some of the categories of metadiscourse found in adult writing (after Vande Kopple 1997) underwent reductions, while others were further subdivided and so their scope expanded. The final taxonomy of metadiscourse presented in Figure 1 contains six major categories subsuming 40 subcategories. The major categories are (i) *text connectives* showing the relationships between parts of the text; (ii) *code glosses* defining or explaining words to clarify intended meanings; (iii) *illocution markers* making explicit what speech acts are being performed; (iv) *epistemological markers* of two types, *modality markers* signaling degree of commitment and *evidentials* showing the basis for referential propositions; (v) *attitude markers* revealing the author's attitude or emotional orientation towards propositions; and (vi) *commentary* addressing readers directly, often via directives or imperatives drawing them into a type of dialogue/conversation.

To elucidate the metadiscourse categories, and their uses by fourth-grade writers, the major intertextual category of *text connectives* is comprised of (i) sequencers, (ii) reminders, (iii) announcements of material, (iv) topicalizers, all of which contribute to global coherence, plus a group of (v) logical-temporal connectives. Global coherence connectives are similar to the organizing bracket in Schiffrin's system (1980), signaling major goals and the organization of discourse stretches. This organizing function is one of the two major functions of discourse along the evaluative meta-function. The evaluative function in argumentation is fulfilled by explanations and challenging evaluations (often challenging), which parallels the evaluative bracket in Schiffrin's system (e. g. "that's off," "that's not the point" in Schiffrin [1980: 219]).

Among logical-temporal connectives, which show inter-clausal and inter-sentential relations, causatives and adversatives were especially scrutinized as both "signal specific type of elaboration" and "convey important contingency relations among states and events" (Goldman and Murray 1992: 505). While adversatives "signal contrastive elaborations" (Goldman and Murray 1992: 505–506), causatives are critical to the plot coherence in narrative discourse (e. g. Van de Broek 1990), and the antecedent-consequent or problem-solution argument structure (e. g. Sanders and Nordman 2000).

Within textual metadiscourse there are also two categories of *code glossing* devices – definitions ("so-called"), and explanations ("I mean..." or children's clarifying "like..."). In our taxonomy, *illocution markers* are conceived as

exponents of performative function, in line with Vande Kopple (1997). Illocutionary markers include *speech acts* that involve verbs or nominalizations of verbs of saying or naming the speech events, such as *tell*, *argue*, *assert*, or *make a point*, *the point is*, or *the problem is*. Whereas words that attenuate their force are called *mitigators* (e. g. “I kind of don’t know...”, “I don’t quite agree...” or tag-questions), and those that boost illocutionary force are called *boosters* (“I totally agree”/“I really think”).

Epistemology markers subsume *modality markers* and *evidentials*. Modality, in general, is rendered via two bipolar signals. On the one hand, there are *hedges* or *plausibility shields* sounding doubts or “small notes of civilized diffidence” (Williams 1981: 49), either rendered by morphological signals, adverbial expressions (*probably*, *rather*), modal verbs (*may*, *might*), some lexical verbs (*seem*, *guess*, *suppose*), or other cautious elements (*to me at least*). On the other hand, there are *emphatics* that underscore the truth value of referential material by means of miscellaneous expressions as well as by *forefronting*, *repetition*, and *punctuation-orthography*.

The broad group of epistemological markers termed *evidentials* (nine categories) shows the basis that authors have for referential material (cf. Barton 1993). Evidential expressions abound in argumentative writing since they contribute to argument justification. According to Hyland (2005: 51), evidentials “guide the reader’s interpretation and establish an authorial command of the subject” as well as help “distinguish *who* is responsible for a position.” CR research (Kim et al. 2011) found that evidentials tend to introduce important rhetorical moves of (i) making arguments explicit, (ii) extending the story world, (iii) acknowledging uncertainty, or (iv) using story evidence. Interestingly, all of these rhetorical moves mesh with corresponding metadiscourse functions (evidentials and speech acts) as analyzed in this study (cf. Latawiec 2012).

Evidentials show the basis for referential statements we make, either from *personal belief* (*I believe*); *from somebody else* or otherwise hearsay evidentials that refer to some external source of authority (*as it is said in the book*); *sensory experience* (*it feels/sounds/looks like*); or forms of reasoning – *induction* (*evidently*) or *deduction* (*should be able to*; see Vande Kopple 1997).

Evidentials from induction are based on observations of a number of particular facts. Thus, induction has been dubbed as *inference à particularis* (Peirce 1865). In arguing from a part to a whole (from evidence to conclusion), children’s signals of induction are “that is why...” inference-ushering devices. Deduction is conceived as *inference à priori* in a chain of statements, each of which is either a premise or consequence of a statement occurring earlier. Deduction as categorized on the basis of children’s uses is synonymous to Vande Kopple’s “I deduce that” or “I hypothesize” in conditional hypothetical

scenarios that involve oneself or others (thus extend the story world) and include conditionals *would*, *could*, *might*, etc. In turn, intended *retroduction* speculations (*inference à posteriori*) formally function as “inference of *a* to the best explanation of *b*.” Wherever children, like little detectives in Sherlock Holmes’ manner, tried to generate hypotheses based on past events to explain observed facts in the present time, so predating the narrative time of story, they resorted to the modal verbs of “could have,” “would have,” “should have,” or “might have” (in the so-called “unreal past” or third-conditional grammatical structures) to explain an occurrence of the consequence. Interestingly, such uses resemble an abductive validation process, where assumptions are first identified that will lead to the desired conclusion.

Lastly, children frequently use evidentials, such as *If/since... then* or *what if*, that mirror the argumentation kernels of warrants and rebuttals in Toulmin’s (2003) model of informal reasoning. Namely, in the move from the Data to the Claim there are “hypothetical bridge-like statements” (Toulmin 2003: 98) called Warrants (“Since”) and possible reservations (“Unless”) before the Claim can be ventured – with or without a Qualifier (“Presumably”). Importantly, “If/since... then,” “what if... then” shape argumentation in the mold of Modus Ponens (If A, then B; A, therefore B./ $A \supset B$; A, therefore B.) or Modus Tollens (If A, then B; not B, therefore, not A.), i.e. two types of inferences that can be drawn from a hypothetical proposition “If A, then B,” and are otherwise called “method of affirming” and “method of denying” (*modus ponens*, Encyclopædia Britannica Online).

On a rhetorical note, evidentials not only appeal to logic (Aristotelian *logos*) but also contribute to building authorial credibility by supporting the author’s persona (trustworthiness, reputation, expertise) during the course of discourse, otherwise known as *ethos* in Aristotelian terms, and so enhance persuasiveness of arguments (Wenzel 1990).

By contrast, Aristotelian *pathos*-building expressions are *attitude markers* (next category in our taxonomy), within which the implicit and self-oriented “I would”-expressions can be identified alongside explicit attitudinal markers. In children’s writing, explicit attitude marking includes “I agree/disagree/like/prefer,” which carry emotional connotations and reveal values (preferred or unpreferred, desirable or undesirable stances). Implicit attitude is revealed by expressions such as “it’s bad/not nice/unfair... that/when people cheat” (in the story Thomas cheated by not following the rules). While in explicit attitude markers the author’s voice stands out (especially the pronominal “I”), implicit attitude marking is more subtle and less ego-centered. Implicit attitude markers account for attitude/desirability assessment by implicature rather than explicit denotation. By analogy to Schiffrin’s view (1980: 201), author’s emotional

attitudes and evaluations are implicitly revealed whenever a child uses a higher level or otherwise two-argument predicates (higher level operators) like “It is true/right/wrong that X is the case” which evidently operate metalinguistically as “complex modifications of propositions.” Both explicit and implicit attitude markers strengthen the persuasiveness of argument being made by showing solidarity or its denial with the bespoken character.

In addition, *deontic modality* has been included in attitude markers (following Crismore et al. 1993). Deontic modality markers are based in deontic logic which deals with the permitted, the obligatory, and the forbidden (Greek *deontos* ‘of that which is binding’, in Encyclopædia Britannica Online). Hence, attitude markers include modal verbs of obligation (*must, have/has to, should*), or lack of obligation (*need not, does not have to*), permissibility (*let, can, could*), and prohibition (*must not, cannot, should not*).

The last major category of interpersonal metadiscourse, termed *commentary*, involves direct addresses to reader as “you,” rhetorical questions and directives/imperatives. Commentary reveals emotional stance towards assertive claims, and thereby strengthens propositional/ideational persuasion by helping “to convey a credible persona and relate to an audience in ways that seem familiar and engaging” (Hyland 2005: 71).

4 Results

As an omnibus test, multivariate analysis of covariance (MANCOVA) was conducted to determine whether there was an overall effect of discussion condition, CR versus Non-CR, on types of metadiscourse used in students' reflective essays. The MANCOVA controlled for reading proficiency (MAT), essay length, and gender, which were entered as covariates. Frequencies in most of the forty metadiscourse categories were very low, skewed, and deviated from normality. Deontic modality subcategories were collapsed into one total category. Categories whose frequencies were extremely low (below five occurrences) were excluded from the analysis. Counts in the remaining categories were transformed [$Y' = \text{SQRT}(Y)$] in order to approximate a normal distribution.

The MANCOVA showed a significant effect for discussion condition, Willk's Lambda $\lambda = 0.743$; $F(32,144) = 1.556$; $p = 0.042$. Partial eta squared (η^2) was employed as a measure of effect size. For discussion condition, $\eta^2 = 0.257$, indicating that 26 % of the multivariate variance in metadiscourse uses was associated with the main effect of discussion condition. Also significant was essay length, $\lambda = 0.339$; $F(32,144) = 8.768$; $p < 0.001$; $\eta^2 = 0.661$. However, the analysis failed to show a significant effect for

reading/language arts proficiency as operationalized in the MAT score, $\lambda = 0.806$; $F(32,144) = 1.085$; $p = 0.361$. Likewise, gender was not significant, $\lambda = 0.778$; $F(32,144) = 1.285$; $p = 0.162$. Thus, no significant difference between boys and girls in the use of types of metadiscourse was revealed in the analysis.

For follow-up univariate tests of fine-grained effects of discussion condition on the categories of metadiscourse, Poisson regression analysis was employed. The Poisson model was selected as best capturing the distribution of this count data (e.g. Cameron and Trivedi 1998). Discussion Condition, Gender, MAT score, and Essay Length were the predictors in the Poisson regression models, while counts in individual metadiscourse categories were the dependent variables.

For simplicity of presentation, Table 1 contains only the metadiscourse categories on which discussion condition had a significant effect (Alpha = 0.05) in the Poisson regression analyses, controlling for MAT score, gender, and essay length. CR-exposed students, in comparison to non-CR peers, had significantly higher counts of *boosters* (97% higher), *implicit attitude markers* (62%), and *commentary* (230%). By comparison, control students showed significantly higher frequencies of *additives* (20%),

Table 1: Poisson regression results for discussion condition.

Metadiscourse categories	Mean		β	S.E.	Sign.	Exp (β)
	CR	Non-CR				
I. TEXTUAL METADISOURSE						
1. Text Connectives						
– Additives	2.61	3.62	-0.23	0.09	0.01	0.80
II. INTERPERSONAL METADISOURSE						
2. Illocution Markers						
– Boosters	0.62	0.54	0.68	0.35	0.05	1.97
3. Epistemology Markers						
Modality Markers						
– Emphatics: Forefronting	0.30	0.66	-0.77	0.39	0.05	0.46
Evidentials						
– Deduction: Others in scenario	0.12	0.36	-1.05	0.34	0.00	0.35
– Deduction: Myself in scenario	0.21	0.59	-0.89	0.27	0.00	0.41
– A posteriori/Retroduction	0.59	1.03	-0.39	0.18	0.03	0.68
4. Attitude Markers						
– Attitude Markers incl. “I would”	0.29	0.53	-0.49	0.25	0.05	0.61
– Implicit Attitude Markers	0.69	0.48	0.49	0.21	0.02	1.62
5. Commentary	0.36	0.12	1.19	0.38	0.00	3.30

Note: CR = 1, Non-CR = 0.

emphatics by foregrounding (54%), *others in scenario* (65%) and *myself in scenario* (59%), *aposteriori/retroduction* (32%), as well as self-oriented *attitudinal markers including "I would"* (39%).

Table 2 shows illustrative uses of those metadiscourse categories which showed significant effect due to discussion condition (note that the top three categories were more frequently used by CR students, while the remaining, by their non-CR peers).

Table 2: Examples of metadiscourse categories in CR and Non-CR participants' essays for which effect of discussion condition was shown in Poisson regression.

Metadiscourse category	Excerpts
Boosters	So this is What I think. (Typographic – capitalization) I mean <u>NO ONE</u> (Typographic – capitalization and underlining) I really think Jack should tell... (adverbial)
Commentary	Well I think that Jack should tell on him. And you should too! So I hope you agree with my side of the story... You need to still tell... Thank you for letting me tell you some of thoughts and helping us out
Implicit attitude marking	...it wasn't fair to the other kids that... It wouldn't be fair if he got the trophy it wasn't friendly too not tell... it wasn't very nice too do that to everybody
Additives	Also what if Jack had let his mom and dad do all the work and he had the greatest and fastest car and he showed Thomas and Jack told Thomas that he couldn't tell and Jack won all the races and Mr. Howard was giving Jack the trophy and then Thomas told on him and Thomas won.
Emphatics – foregrounding	All Thomas did to his car was paint it and put on stickers. All he cared was to win the car model race. All Thomas done was put stickers on the car.
Others in scenario	Thomas may not be Jacks friend any more Mr. Howard would say did I tell you nobody cant help you ... he would be truthful and being truthful get him a long way like at U of I.
Myself in scenario	if I was Jack I would tell If I were Jack and Thomas had no friends I would be his friend. If I was Jack Thomas would have gave that trophy to 2 nd place and get kicked out. I would have built my car my self. My car would have won the race.

(continued)

Table 2: (continued)

Metadiscourse category	Excerpts
A posteriori/retroduction	I think Jack would have won the race if he told on Thomas. Jack could of won so he would of won but if he didn't tell. If Thomas brother didn't straighten the wheels. Jack would of won the trophy . Maybe Thomas could have told the teacher the truth and said to the class that he wanted to donate the trophy to our classroom.
Attitude marking incl. "I would"	I would want him to tell on Thomas I would like if people do their work there self I would fell bad that's why I am glad he didn't tell on him

Gender had a strong relationship to essay length (boys' M=75 words, girls' M=121 words) and so counts in the metadiscourse categories were bound to be much higher for female writers. With the caveat that gender was not significant in the MANCOVA, in the Poisson regression analyses that controlled for essay length, discussion condition, and reading proficiency, girls had significantly higher frequencies of *total emphatics* (37%), *emphatic orthography-punctuation* (193%), *adverbial hedges* (64%), and *boosters of illocutionary/speech-acts* (165%). Girls showed a somewhat stronger response than boys to CR in respect to increased use of *logical-temporal connectives*, *topicalizers*, and *sequencers*, all characteristics of academic discourse. With the caveat, again, that reading proficiency was not significant in the omnibus MANCOVA, in the Poisson regression analyses, other things being equal, MAT score significantly predicted higher use of *sequencers*, *if-conditionals*, "if/since... then" *evidentials*, and *evidentials total* as well as marginally lower use of *totals of attitude markers* without *deontic modality*. Because the empirical warrant is weak, possible differences in metadiscourse attributable to gender or reading proficiency will not be further discussed.

For illustration of metadiscourse in children's writing, two complete essays were selected that took different positions on the question, Should Jack tell on Thomas? Both are representative of the whole pool of essays in metadiscourse density. Original spelling and grammar are preserved for authorial flavor. The first essay has a CR author.

(1) Jack should tell on Thomas. Here's why. First, Thomas cheated. His brother built even though Thomas was supposed to. Also, if Jack doesn't tell, Thomas won't ever learn to do things for himself. Plus it isn't fair to the other races that Thomas won. Someone else

should have won because Thomas cheated. All Thomas did to his car was paint it and put on stickers. His brother did the rest. That makes him non-worthy of winning. These are the reasons why Jack should tell on Thomas.

The essay contains interesting uses of connectives that organize the essay around the global goal, and so are labeled as global coherence markers. With “here is why” the child announces new material (*announcement of material*), then sequentially shows the reasoning line by signaling where the argument is heading with “first”, “also”, and “plus” (*sequencers*). The child closes the essay with the terminal bracket “these are the reasons why” (cf. Schiffrin 1980). The terminal bracket and the initial bracket also explicitly mark the performance of specific *speech acts*. By signaling a return to the topic of the essay by means of a *topicalizer* (deictic “these are”), the speech act labels the material via illocutionary “reason giving.” Instances of extending the story-world are evidenced in conditional “if Jack doesn’t tell, Thomas won’t ever learn to do things for himself” (*others in scenario*), and the structure, “someone else should have won” (*retroduction/a posteriori intended*). Intensifications in “even though Thomas” and “Thomas won’t ever” fall under the category of *emphatics miscellaneous*, thus revealing the child’s stronger commitment to the truth value of the propositions. Likewise, emphasis has been added by forefronting an object before the subject in the phrase, “all Thomas did was” (*emphatics by forefronting*). This “ground-before-the-figure-construction” (Chen 2003) gave the initial part of the sentence (object/recipient) greater prominence, which in a nuclear English sentence belongs to the subject (an agent). Modal verbs “should” or “should have” contribute to modality, too (nota bene, being coded as deontic *obligation* and part of hypothetical scenarios, thus having multiple functions; cf. Jakobson 1980). An emotive evaluation in the two-argument structure “it isn’t fair... that Thomas won” indirectly reveals the author’s attitude (*implicit attitude marker*), without centering the attitude on the authorial speaking voice. The reference to “the other races [sic!]”, a whole group of children rather than himself/herself, shifts focus away from the author. At the same time, “it isn’t fair that...” operates metalinguistically by indicating the modification or combination of propositions (that Thomas won) in a way that parallels complex logical operations (after Schiffrin 1980: 201).

For the balance, another essay showcases the opposite point of view on whether Jack should tell on Thomas and is written by a non-CR author.

(2) Jack should not tell on Thomas because no one like a tattletale and yes jack should tell on Thomas he had cheated in the race. If jack had cheated he would have won every race he was in if his dad had done it all by himself jack have not lost a race. If jack had not do it by his self he would have run just like Thomas. If jack was Thomas and Thomas was jack Thomas would have told on jack and then the would call a tattletale hanging on a bull’s tale while the bull begged to pp you will have a cup tea when the bull begins to pup you will have a cup soup. The end

In (2), in response to the prompt question, the child provides his position directly via *deontic modality* of forbidden category (“should not”), without explicitly signaling his speech act (e. g. by *I think/say/pick no*) unlike his CR-exposed peer in (1), and follows with an explanation ushered in by a *causative* (“because”). Immediately afterwards, without punctuation (almost “in one breath”), the essay leads to the opposing viewpoint with an *additive* (list-like binder) followed by a position-stating in an affirmative *speech act* or rather agreement token “yes” and a modal verb of *obligation* (“should”), which reveals the child’s normative attitude (attitude marker). There are several evidentials that hinge on hypothetical deductions (would-be constructions), and so extend the story-world by putting *others in scenario* (“if Jack was Thomas and Thomas was Jack...”; “they would call...”) embedded in *If-then* formal structure. Also, especially frequent are *intended retro-duction/a posteriori* structures that utilize unreal past conditionals (“if Jack had cheated he would’ve won...”; “If Jack had not do it by his self [sic!] he would have run...”). In the final lines with a hypothetical bull as *another in scenario – deduction*, there is a direct address to the unknown “you”, a prospective reader, which has an effect of pulling the reader into a dialogue – for impact or urgency. This is an instance of *commentary*, which is agency-prompting, that is embedded in future-oriented *deductive* constructions (“will be”) that are linked by *logical-temporal connectives miscellaneous* (“while the bull”; “when the bull”). There is an instance of *emphatic adverbial* in “just like” which adds to the emotional appeal. There are no plausibility shields/hedges (generally contributing to modality marking) that would attenuate the array of speculative scenarios, besides which reveal the child’s reasoning method or conceptualization of reasoning. Except for normative modals (*should, shouldn’t*) and an emphatic (*just*), there seem to be no other attitudinal markings. Lastly, clauses are mostly linked by *additives*, which do not show important interconnections in argumentation. Without undermining the value of abstract thinking, proliferation of hypothetical scenarios leads to imbalance between logical, ethical, and emotional appeals, and so (2) tips to the side of hypothetical narrative dream-like weaving in place of justification or anticipation of opposing viewpoints/counterarguments.

5 Discussion

The major finding of this study is that, after accounting for essay length, reading proficiency, and gender, there were systematic differences identified in meta-discourse patterns in the essays of fifth-grade students who had participated in Collaborative Reasoning as compared to control students who had not.

The essays of CR-exposed students tended to directly address the prospective reader and otherwise engage the reader via *commentary* (interpersonal metadiscourse). Metadiscursive commentary increases reader engagement by shifting agency onto the addressee of *you*-oriented expressions. Higher incidence of commentary adds to emotional appeal by putting the addressee in the shoes of the bespoken character, thus increasing the persuasiveness of statements, as rhetoric suggests (e. g. Wenzel 1990).

Likewise, as compared to control students' essays, the essays of CR participants more explicitly and cogently signaled the illocutionary speech acts as augmented by frequent *boosters*, via intensifiers of performative verbs. CR-exposed students expressed their attitude in a more generalized and impersonal manner using more *implicit attitude markers*, which hinge on a predicate that takes two arguments (one in the superordinate and one in the subordinate clause) and embody evaluative forms of the sort, "it is right/wrong/unfair/good that X is the case", thus functioning as higher-level operators (Schiffrin 1980).

The implicit attitude-marking of CR writers conveyed pro-social or common-good thinking, whereas the explicit attitude expressions, including "I would like/want/prefer," as frequented by control students, conveyed more self-oriented thinking. Implicitness of attitude expression may suggest better abstraction of the "generalized other" (Mead 1934) or "the wise third" (François 1998), as a function of the conceptualized "remote audience" (Linell 2009). This phenomenon may be attributed to frequent expressions of diverse viewpoints and perspectives during collaborative discussions as prompted by such rhetorical moves as "other people might think" (cf. Anderson et al. 2001).

Overall, the more frequent interpersonal uses of commentary, boosters and implicit attitude marking seem indicative of what Mauranen (2003) called the "socializing role" of metadiscourse. CR students' socialization into academic skills of argumentation is indicated by boosters of speech acts ("I *really* think/argue/say"), since becoming part of an academic community entails being able to "present 'strong arguments', ask 'appropriate questions', make 'interesting points', and perform other similar speech acts" (Väliveronen 1992; after Mauranen 2003: 19). Thus, CR students' use of boosters of performative verbs ("argue" or "claim") results in stronger and more explicit formulation of arguments. Boosted speech acts highlight what is important in a text and help to organize the text in a hierarchical, not merely linear way (Mauranen 2003), which facilitates readers' comprehension of thus prioritized information.

More generalized, de-centered, and less subjective or egocentric attitude indicates a degree of socialization into academic and professional metadiscourse. The CR students' apparent awareness of how attitude markers will be received suggests that they are gaining metacognitive control over the evaluative function

of metadiscourse (e. g. Hyland 2005). They may even show resistance towards manipulative devices as Kamalski et al. (2008: 545) observed, “when coherence markers cause readers to recognize an attempt to influence them, they build up resistance and it becomes difficult to persuade them. Also, subjective marking causes readers to recognize the persuasive author’s intent more easily. Furthermore, subjective markers seem to cause resistance to persuasion, whereas objective markers improve integration of information.”

The more socialized quality of the writing of CR-exposed students was heightened by metadiscursive *commentary* that draws the reader into a kind of dialogue. This engagement-enhancing metadiscourse again manifests CR students’ socialization into demands of academic discourse, where better representation of the audience allows for more apt placement of the writer as an agent. Reader-oriented expressions make “more audible the internal dialogue” of the writer in the composing process (Billig 1987), as if arguing with oneself while “thinking out an argument” (Hample 1985) in the context of “multivoicedness” or “polyvocality” of reverberating discussions with others past or imagined (Bakhtin 1981). Commentary uses in CR children’s essays reveal traces of “dialogism” (cf. Linell 2009) as their texts open up for “other voices.” These observations suggest CR writers’ better metacognitive awareness or understanding of text demands on readers as well as greater resourcefulness in expressing a stance to influence readers (Hyland 2005; Latawiec 2012).

The essays of CR students had greater cohesion due to more diverse and balanced use of logical-temporal connectives that bind text not only in the simplest additive manner, but also in disjunctive, contrastive, and causative structures, which are especially important for signaling multiple links and interconnections of ideas in argumentation. Conversely, the Non-CR students were likely to link their propositions with the simplest, least globally coherent *additive* conjunctions (Sanders and Nordman 2000). In terms of idea binding, control essays resemble the oral rather than the written style (cf. McCarthey 2002) and may reflect a carry-over from the conversational domain (cf. Goldman and Murray 1992). Given the list-like binding of non-CR essays it can be argued that control students had less control of rhetorical organization and “inner binding” of arguments (Mauranen 2001), which was more effectively utilized by CR-exposed peers.

Control students made more emotional appeals by means of *emphatics* and *hypothetical scenarios*, both self- and other-centered. They expressed evidentials by describing others or selves in speculative conditional structures, as well as *retroductive/aposteriori* forms expressing detective-like guessing about past conditions. The pattern seen in non-CR writing may reflect control students’ conception of argumentation as the proliferation of stories, rather than the logical justification of claims or juxtaposition of ideas and arguments in anticipation of counterarguments (e. g. Hample 2007).

The CR writers' adoption of several features of academic and professional metadiscourse may be understood as a form of "meme transmission" (Blackmore 1999), where memes are gene-like units of culture. In the context of small-group collaborative discussions, successful rhetorical memes are copied and passed on in talk and into students' writing. This is a material case of meme transmission well documented in other studies of Collaborative Reasoning discussions, the "snowball phenomenon," in which useful "argument stratagems" (functional rhetorical moves) introduced by innovative children have been found to spread from child to child and occur with increasing frequency (Anderson et al. 2001; Dong et al. 2008; Lin et al. 2012).

6 Concluding remarks

Overall, the findings indicate that CR students' metadiscourse highlights performative (illocutionary) and reader-engaging (perlocutionary) argumentation, less subjective attitude marking, more diverse and balanced logical connections and text binding, suggesting greater metacognitive insight into how readers will take their arguments and greater appropriation of argument schemas as well as agency and reasoning-enhancing formal elements. Bearing in mind that participating children did not receive any training in writing, these results seen in writing are attributable to participation in oral discussions, thus corroborating cross-modal transfer (cf. Reznitskaya et al. 2001, Reznitskaya et al. 2009).

The study is, however, not devoid of limitations. The analysis has been limited to the written corpus, while the cross-corpora explorations have been the focus of another study (Latawiec et al. 2014). Also, the study adopted a rather comprehensive and interactive model of metadiscourse to investigate its potential for illumination, while other perspectives may have been more or equally effective. Though the qualitative analysis identified effective metadiscursive uses (that overall suggest higher rhetorical skill and metalinguistic awareness of CR-exposed children), still there were linguistic phenomena untapped by the analysis or ineffective, wordy metadiscourse uses in students' essays. Lastly, the study might have benefitted from longer CR exposure, which might better capture transfer from the personally engaging and intellectually stimulating Collaborative Reasoning paradigm.

Considering the scarcity of studies on children's metadiscourse, the present study breaks fresh ground in examining thought mediation that accompanies "thinking-out" an argument (Hample 1985), with its bidirectionality of interaction from mind to discourse and from discourse to the mind (Billig 2003), and so provides valuable, though tentative, insight into the changing mental processes

that arise within discourse. Thus, the study enhances understanding of young adolescents' thinking-in-argumentation as well as their metacognitive thinking-about it, as reflected in authorial projections in metadiscourse.

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