

An Exploration of the Link between Language and Cognition

From Vygotsky's Sociocultural Theory to CLIL

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Abstract In this article, we will explore the work of several scholars who, albeit operating in different contexts, have adopted Vygotsky's Sociocultural Theory as a starting point for their research. First of all, Vygotsky's work will be briefly presented; second, Barnes and Mercer's research on L1 and cognition will be commented; third, Swain's research in immersion contexts will be shortly outlined; finally, the CLIL environment will be explored. The *fil rouge* which bonds all these contributions is the belief according to which language does not just 'carry' information but shapes thought.

Summary: 1. Introduction – 2. Language and Cognition: Vygotsky. – 3. L1 and Cognition: Barnes and Mercer. – 4. L2 and Cognition: Swain. – 5. FL and Cognition: CLIL. – 6. Implications and Conclusion.

1 Introduction

Education should help children to gain greater awareness and appreciation of the discourse repertoire of wider society and how it is used to create knowledge and carry out particular activities. It should [...] enable them to use language more effectively as a means for learning, pursuing interests, developing shared understandings and generally getting things done. (Mercer 2000, p. 149)

Starting from this reflection, in the following pages we will explore the work of several scholars who, albeit operating in different contexts, have adopted Vygotsky's Sociocultural theory as a starting point for their research. The *fil rouge* which bonds all these contributions is the belief according to which language does not just 'carry' information but shapes thought.

2 Language and Cognition: Vygotsky

Three crucial concepts from Vygotsky's Sociocultural Theory of mind (SCT) will be briefly commented, in order to offer a first exploration of the language-cognition link.

The first two concepts, connected with each other, are those of *instruments* and *mediation* (cfr. Vygotsky 1978). SCT claims that all artifacts, material and symbolic, produced within a certain culture, are instruments that mediate cognition, in other words they are devices that enable higher human cognitive functions. The concept of 'instrument' is closely linked with the socio-cultural nature of Vygotsky's theory because it refers to: i. something which is used to solve a *practical problem*; ii. something whose use is learnt by watching *others* while using it; iii. something whose uses are intimately influenced by the *social context* in which it is adopted (cfr. Mercer 2000). Vygotsky classifies instruments into two broad categories, *tools* and *signs*. The former are concrete objects, externally oriented, adopted to carry out material actions (e.g. a glass is an instrument used for drinking). On the opposite, the latter are symbolic, abstract representations, internally oriented towards the subject (cfr. Lantolf; Appel 1994).

Among symbolic tools, Vygotsky includes *language* (verbal language), which is conceived as having a double value, social and psychological. It should be noted that according to the Russian scholar, language is a *social instrument* first of all, which «is located out there in social interaction» (Dalton-Puffer 2007, p. 264), before being interiorized and becoming a psychological tool. As a *social device*, language allows to interact with others: it facilitates *intermental* processes such as communication, knowledge sharing and knowledge development. As a *psychological tool*, on the other hand, it enables cognitive and metacognitive interaction with one's self: it helps *intramental* processes which sort, organize and categorize one's individual thoughts and ideas. With reference to language as a psychological tool, Vygotsky distinguishes two types of speech (cfr. Lantolf & Appel 1994): *inner speech* and *private speech*. The first is a kind of self-directed speech that the subject addresses to him/herself only: it is pure meaning, highly contextualized and idiosyncratic. On the other hand, the second type of speech is still self-directed but it is externalized and made conscious through verbalization. The difference between the two types of speech is that the message of the first would be incomprehensible by an external hearer, while the second would be clearer because verbalized.

According to Vygotsky, language is not just a 'vehicle' for information but *shapes* thought: «Thought is not merely expressed in words: it comes into existence through them» (Vygotsky 1987, p. 219). In particular, in its double function of social and psychological tool, language enables *internalization* of concepts and knowledge coming from the outside world, thus redefining the overall organization of one's thoughts, but also it allows the

externalization one's ideas, thus turning abstract thoughts into concrete 'objects'. Therefore, an utterance – be it oral or written – is a *cognitive process* (i.e. the act of saying), in other words a process in which the speaker is molding, 'giving shape' to his/her thought, and an *objective product* at the same time (i.e. what has been said), an 'object' to share with others and further think upon (cfr. Wells 2000, in Swain 2000).

The third concept from Vygotsky's SCT which will be briefly summarized is that of Zone of Proximal Development (ZPD). It is defined as the difference between the *actual* level of a pupil's cognitive development (i.e. without receiving any assistance) and the *potential* level of development s/he could reach under an expert's guidance¹ (cfr. Lantolf; Appel 1994). The crucial component of Vygotsky's ZPD is the *interaction* between interlocutors, which happens through language. Facilitating knowledge sharing, interaction contributes to create intersubjectivity among interactants and, above all, it allows to negotiate and co-construct shared meaning: the externalization of one's individual ideas produces 'crystallized thoughts', concrete 'objects' to share with others and further reflect upon, to discuss, to bring into question and then to re-internalize in a new, enriched form. The continuous exchange between interlocutors ensures that this knowledge-building process have potentially no end.²

3 L1 and Cognition: Barnes and Mercer

During the second half of the 1970s, in the UK, the Bullock Report (1975) made known alarming data about the English population's relapse into illiteracy: the report observed that young people, once their formal school education was over, no longer used their native language, neither to read nor to write. A plausible explanation for such a circumstance was that these young people had a very limited knowledge of L1 and thus did not feel encouraged to use it in their everyday lives. Therefore, the Report proposed the idea of LAC, *Language Across the Curriculum*: the L1 should not be a prerogative of the English teacher only but it should be spread all over the school curriculum and every teacher should pay particular attention to the language dimension of the subject taught.

Barnes and Mercer's studies take place in such a context. In particular,

1 The expert could be an adult (e.g. a teacher or a parent) but also a peer (e.g. a friend or a classmate).

2 The concept of ZPD is very similar to that of *scaffolding*, in the definitions proposed by Wood et al. (1976, in Swain et al. 2011) and Bruner (1978, in Mercer 2006). According to these scholars, scaffolding is a process during which a pupil, under an expert's guidance, can concentrate only on the skill s/he is mastering and therefore is able to solve a problem (or complete a task) which would otherwise be too difficult for him/her.

the two English scholars adopt Vygotsky's SCT to dig deeper into the fundamental role played by language – the L1 in this case – with respect to cognition and learning. In particular, Barnes proposes a *constructivist model* of learning:

Most of our important learning, in school or out of it, is a matter of *constructing* models of the world, *finding* out how far they work by *using* them, and then *reshaping* them in the light of what happens. (Barnes 2008, p. 3, emphasis added)

According to the scholar, the learner «is never truly passive» (Barnes 2008, p. 2) because learning, as such, is an *active process* of construction of new meanings and new knowledge. If we observe the verbs in Barnes's citation – constructing, finding, using, reshaping – we will notice that they imply an idea of becoming, of never-ending change and development (cfr. Wells & Ball 2008). Barnes claims that the aim of school education in general should not be to provide pupils with finished *products*, 'inert' knowledge passively accumulated; the true aim should be to help learners improve the *process* of «working on understanding» (Barnes 2008, p. 4).

In order to 'work on understanding', Barnes proposes a dialogic instrument that he defines as *exploratory talk* (cfr. Barnes 1976/1992, in Barnes 2008). Therefore, we realize that in Barnes as well – like in Vygotsky – it is language that fosters understanding, but not only: language allows us to *explore* and *expand* our cognitive horizons.³ *Exploratory talk* enables us to think out loud, it is a sort of 'thought in words' and, given its explorative nature, is characterized by hesitations, pauses, interruptions, broken utterances: through it the learner (or learners) tests his/her knowledge of the subject, tries out new ideas, formulates them, considers the links between them, listens to how they sound. Thus, exploratory talk captures a process which is *in fieri*, it is verbalized reasoning, learning taking place, and it is intimately aimed at the subject (or subjects) who produces it.

Unlike exploratory talk, *presentational talk* (cfr. Barnes 1976/1992, in Barnes 2008) represents the result – one amongst many others – of a process of understanding, it is an end product, well-articulated and refined: through it the learner communicates what s/he has learnt, paying atten-

3 However, the link between talk and cognition had already been explored in the past. In particular, at the very beginning of the 19th century, the German poet von Kleist, showing he was well-aware of the power of speech with respect to learning, affirmed: «If you want to understand something and can't figure it out by pondering, I would advise you, my dear ingenious friend, *to speak of it* to the next acquaintance who happens by. It certainly doesn't have to be a bright fellow: that's hardly what I have in mind. You're not supposed to ask him about the matter. No, quite the contrary, you are first of all *to tell him about it yourself*» (von Kleist 1806, *On the Gradual Production of Thoughts Whilst Speaking*, as quoted in Swain 2006, p. 97, emphasis added).

tion to contents, form, style. Thus it is not directed inwards, towards the subject, but outwards, towards the audience who is listening (or reading).

Like Barnes, Mercer too underlines the connection between language (L1) and cognition and does so developing the concept of social speech posited by Vygotsky. Mercer claims that language allows to «think together» with others and calls this activity «*interthinking*» (Mercer 2000, p. 1, emphasis added). Thanks to it, social speech becomes *private* because it lets interlocutors build new, shared knowledge: in this sense, it is not considered 'private' with respect to a single individual, but it is 'private' with reference *to the group* which produces it, a group where knowledge is shared, discussed, criticized, and where everybody learns, plans and coordinates his/her actions. According to Mercer, *interthinking* is cognitive development made possible by language. In particular, the scholar takes Vygotsky's ZPD and Wood and Bruner's scaffolding to fuse them in his IDZ, *Intermental Development Zone* (cfr. Mercer 2000), which is built between a learner and an expert, or among peers: the *interthinking* is realized by means of exploratory talk between interlocutors, which helps to share thoughts but also to discuss them, criticize, enrich, modify them to finally re-internalize and make them one's own again. Mercer is deeply convinced of the value of collaborative learning:

One good test of whether or not you really understand something is having to explain it to someone else [...] whom you can treat as a social and intellectual equal. (Mercer 2006, p. 89)

Collaborative learning is valuable provided that a few conditions are in place. First of all, it is necessary that pupils are taught about how to collaborate (cfr. Galton & Williamson 1992, in Mercer 2006). Second, they need to have a common vision about what is considered relevant and worthy of discussion (cfr. Mercer 2006). Finally, they must share a goal, a final objective to reach (cfr. Barnes & Todd 1977, in Mercer 2006). These three conditions let us understand that collaborative work requires a considerable amount of effort devoted to planning activities beforehand, not to run the risk of wasting the added value it can offer (cfr. Mercer & Dawes 2008). We will come back to collaborative work later on, when talking about task-based activities (cfr. par. 4).

As regards classroom talk, Mercer discusses Sinclair and Coulthard's model of triadic dialogue, the IRE, *Input-Response-Feedback* (1975, in Mercer & Dawes 2008). The scholar claims that this model, presenting two moves by the teacher (the initial input and the closing feedback, generally quite lengthy) and only one by the pupil (the response, usually very concise), is highly *asymmetrical* in its nature, given that the teacher has the control and responsibility of the whole exchange. In order to resolve this imbalance, Wegerif and Dawes (2004, in Mercer & Dawes 2008) 'up-

date' the IRF model and propose the IDRF, Input-*Discussion*-Response-Feedback, which incorporates a moment of discussion between pupils about the input provided by their teacher, before formulating a response. In this way, the overall exchange is still in the teacher's control but there is more room for peer interaction, for collaboration, during which group exploratory talk allows pupils to share, discuss, criticize, their own knowledge and ideas, expand them, learning and developing together: the final result of this collaborative activity is much better than the sum of individual contributions. In the IDRF model, the teacher's role is crucial because s/he is called to be a *guide* for his/her pupils. The teacher-guide should assume an *active role* with respect to the use of language (cfr. Mercer & Dawes 2008), s/he should model it, let pupils see and become aware of how it can be productively used to «think together», to reason together during collaborative activities.

4 L2 and Cognition: Swain

Swain's studies are collocated in the field of second language acquisition research in bilingual immersion contexts in Canada. In these contexts, pupils are required to study the entire school curriculum (or a good portion of it) in the L2 of the country where they live. In this case, in the Canadian region of Ontario, pupils whose native language is English have to deal with all school subjects in French. Swain starts from Vygotsky's SCT and applies it to L2 learning.

Studying immersion classes, in the mid 1980s, Swain arrives at the reflection according to which «not all content teaching is necessarily good language teaching» (Swain 1988, p. 68). Formulating her theory of *comprehensible output* (cfr. Swain 1985), she claims that in order for pupils to learn a language, it is not enough to be exposed to input made comprehensible by the teacher (cfr. Krashen 1982): learning cannot happen through mere *reception* of contents, oral or written, but it needs pupils to be actively involved in *production* as well.

We can understand discourse without precise syntactic and morphological knowledge, but we cannot *produce* it accurately *without* precise syntactic and morphological knowledge. (Swain 1988, p. 73, emphasis added)

According to Swain, language production has a number of advantages (cfr. Swain 1993, 2000). To begin with, if pupils get used to producing language this will lead to automaticity in use which, in turn, will improve their fluency of expression. Second, language production forces the learner to process the language not only at the *semantic* level (i.e. to get the message)

but also at the *syntactic* level (i.e. to convey the message correctly), thus noticing the ‘holes’ in his/her linguistic competence (cfr. Schmidt 1990, in Coonan 2012): in this way, the pupil becomes aware of what s/he does not know or knows only partially. Third, language production allows learners to formulate and test hypotheses about how the L2 s/he is learning functions. Finally, producing language, both in written and oral form, is the only way to receive feedback about what has been produced: be it from the teacher, from a native speaker of the L2, or from a classmate, feedback lets learners confirm (or reject) the hypotheses previously formulated, it lets them notice linguistic forms (*focus on form*: Lyster 1998, Swain 2001, both in Coonan 2007) to be acquired or improved, it makes them more aware of their strong and weak points. From what has been said hitherto, we understand that, according to Swain, language production is not a mere exercise (oral or written) as an end in itself but it is interaction, dialogue: when the learner ‘negotiates’ meanings with an interlocutor, s/he receives the feedback needed to confirm (or not) what s/he hypothesized about the language.

Like Vygotsky, albeit in a totally different context, Swain as well attributes crucial importance to verbal interaction, not only to acquire new knowledge but also to learn the language: *linguaging* (cfr. Swain 2006, 2009, 2011), or *verbalization* (cfr. Swain 2000), is a kind of collaborative dialogue which is *social* – it happens between learners – but at the same time *cognitive* – it has an impact on higher cognitive functions – and can be defined in terms of «language use mediating language learning» (Swain 2000, p. 97). Swain underlines that linguaging is intimately connected with human cognition, with the faculty of thought, in that it is a dynamic process, with potentially no end, of using language to create meaning, to understand, to solve problems (cfr. Swain 2006). In a study in 2009, Swain observed that the habit of English students ‘to language’ together to solve their problems (linguistic or content problems) in French immersion classes was directly linked with a higher quantity and quality of their learning.⁴ Like in Barnes and Mercer’s *exploratory talk* (cfr. par. 2), «in linguaging we see learning take place» (Swain 2006, p. 98) because *linguaging* is «a means by which one comes to know what one does not know» (Swain & Lapkin 2013, p. 105).⁵

4 In this sense, Swain’s results are in line with those of other researchers (see for example Chi et al. 1994, for biology) who support the efficacy of self-explanation for learning.

5 Hall as well, in his PhD dissertation (cfr. Hall 1996), explores the link between linguaging and consciousness, affirming that language can have therapeutical functions in helping individuals to re-cognize, restructure, reorganize their knowledge through language.

5 FL and Cognition: CLIL

CLIL, *Content and Language Integrated Learning*, can be considered an evolution of LAC, proposed by the Bullock Report in the 1970s. The main difference is that, unlike with LAC, CLIL envisages the use of a *foreign language* (FL) in some areas of the school curriculum. This idea of using a foreign language across the curriculum is also captured by Grenfell's acronym MLAC, *Modern Languages across the Curriculum* (2002) whereby he extends the original LAC concept to languages other than the normal school language.

In particular, within the project *Languages of Schooling*,⁶ the Council of Europe recognizes the presence of several languages in the young European citizens' educational path: not only their native language (L1) but also possible *regional* or *minority* languages (e.g. in the Italian context: Ladin, Friulian, Walser, to cite a few), *classical* languages (i.e. ancient Greek and Latin) and *modern* languages (e.g. in Italy: English, French, German, etc). However, the great innovation introduced by this European project is the fact that these languages of schooling are valued not only in terms of separate school subjects, but also as *being present* in all the other school subjects: the focus is thus on the *language dimension* of the subject taught/learned. CLIL has been developed in this context.

Envisaging cognitive development through the productive use of the FL, CLIL can be considered as another effective expression of the link between language and cognition, language and learning. With regard to this, the work by Beacco (cfr. Beacco et al. 2007) – within the European project previously mentioned – will be briefly commented. Working in the field of history teaching, Beacco's group identified the cognitive-linguistic forms that are typical of the subject (i.e. history) and useful for its teaching and learning: as a consequence, the history teacher is called to acquire greater awareness about the *linguistic dimension* (as well as the cognitive) of the subject s/he teaches. In addition, Beacco et al.'s work has several implications not only for the non-linguistic subject but also for the curriculum of the FL adopted: the FL teacher is called on to focus on the *cognitive dimension* of the FL (CALP), in order to offer learners the linguistic instruments they need in order to handle new contents and learn them.

Referring to the Italian context, where CLIL teachers are non-linguistic subject teachers, Coonan (2012, 2014) reflects upon the crucial issue about how the CLIL teacher could promote the learning of both subjects – the linguistic and the non-linguistic one – in an integrated manner. To this end, the scholar suggests the adoption of Willis' Task-Based methodology (cfr. Willis 1996). This methodology ensures that pupils collaborate in small

6 http://www.coe.int/t/dg4/linguistic/Schoollang_en.asp (retrieved: 2014-12-04).

groups and work together towards a common goal, an end product which represents the ‘materialized’ outcome of their learning. Willis’ methodology consists of three main phases. In the first one, the *pre-task* phase, pupils are called to plan and prepare the actual execution of the task: in this phase, the teacher offers pupils the support and the cognitive-linguistic instruments (e.g. useful lexicon, language frames, pre-knowledge) they need to proceed. The second, the *task* phase, distinguishes between three separate moments: in the first, pupils work together towards the end product; in the second moment, they plan and prepare their presentation to the class; in the third, they present their work to their classmates and teacher. Finally, in the concluding phase of the methodology, the *post-task* phase, teacher and pupils examine all the different outcomes and discuss the problems that have arisen – language problems, content problems, or both. For the purposes of the present article, the second phase of Willis’ methodology – the *task* phase – appears particularly interesting: pupils are first of all to discuss among themselves in view of their presentation, and then to present their work to the class. Therefore, we see that during collaborative work pupils are putting into practice several of the concepts we have hitherto reviewed: through *interthinking* (Mercer, cfr. par. 2) and thanks to the creation of a common IDZ (Mercer, cfr. par. 2), pupils are able to productively use *exploratory talk* (Barnes, cfr. par. 2) or *linguaging* (Swain, cfr. par. 3) with the aim of learning together and co-constructing shared knowledge as regards both content and language, in an integrated manner. On the opposite, in the following presentation phase, pupils adopt *presentational talk*, polished, refined, well-organized, aimed *outwards* at an audience listening (and not *inwards* at a subject reasoning).

With regard to the CLIL teacher, Coonan (2012, 2014), Serragiotto (2014) and Dalton-Puffer (2007) claim that his/her role is crucial: the teacher is called to actively stimulate pupils’ language awareness, offering them all the necessary linguistic instruments they need to carry out those cognitive operations leading to learning, in the belief that it is language which shapes thought and knowledge (Vygotsky, cfr. par. 1). However, in order for teachers to help their pupils become aware of the link between language and learning, it is necessary that they themselves become conscious of that as well.

6 Implications and Conclusion

Cultural psychologist Rogoff talks about cognitive development in terms of «apprenticeship *in thinking*» (Rogoff 1990, as quoted in Mercer 2000, p. 133, emphasis added). In this contribution, we have seen how language is intimately connected with the human faculty of thought and therefore we can conclude that language – be it L1, L2 or FL – helps cognitive devel-

opment. Rogoff identifies «three planes of focus» (Rogoff 1995, as quoted in Cazden 2008, p. 152): i. plane of individual cognitive development; ii. plane of social interaction (through language); iii. plane of cultural activities (i.e. classroom activities) where i. and ii. take place. Language is what bonds together these three levels and, as we have seen so far, fosters cognitive development, allows social interaction and characterizes activities in class.

Bearing in mind that language is a crucial aspect in defining such activities, some pedagogical implications are suggested. First of all, in the light of what has been said so far, it is necessary to stimulate learners' active participation in terms of language production: in this way, not only will they improve their knowledge of the language, they will also be able to reason more effectively on contents.⁷ Second, it is important that pupils acquire awareness of the power of language with respect to cognitive growth, and understand that its productive use is a helpful instrument towards learning in general.

In order for these situations to happen, the teacher's role is pivotal. First, *all* teachers⁸ ought to possess a high degree of language awareness: they should be conscious of the language-cognition link but also - in the belief that teaching is communication - of the link between *language and teaching*: language helps the teacher to function as such, it is through language that intersubjectivity with pupils is established, it is thanks to language that the teacher as a *guide* (Mercer, cfr. par. 2) leads his/her pupils along their path of cognitive growth and helps them to co-construct their own learning. Secondly, teachers should be linguistically competent (cfr. Coonan 2014; Serragiotto 2014). The teacher's linguistic competence is *not* a given, even for teachers working in L1 contexts. Not only does it imply that teachers know the language (i.e. morphology, syntax, lexicon) and micro-language of their subject (i.e. subject-specific lexicon, types of text and genres, typical syntax), but it also implies that teachers have a good command of the language *for teaching* (e.g. interacting, stressing key words/concepts, reformulating, summarizing, synthesizing, etc.) and, above all, the capability of *being flexible*: teachers should know how to handle unexpected classroom situations, departing from their schedule; they should know how to value the unexpected (of which pupils are usually the main source) and integrate it into their lesson plan. Nevertheless, in order for this happen, *openness* is fundamental: teachers need to be *willing*

7 In the field of CLIL, we suggest reading Coonan's study (2008), where the link between didactic mode and student production is explored, and Menegale's study (2008), in which the author discusses the role of different types of teacher questions in encouraging (or not) student production.

8 *Language* teachers (L1, L2, FL, etc.) and *non-language subject* teachers (maths, art, history, etc.).

to be called into question, to reconsider their role in the light of the link between language and cognition. This is the first step towards the teachers' own cognitive growth as an educational professional, whose mission is not to fill pupils' heads with 'inert' knowledge (Barnes, cfr. par. 2) but to help them learn how to learn *using language*.

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