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Towards a model of scaffoldings during multimodal online interactions in a teletandem environment

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1. Introduction

This study analyzes how, during teletandem sessions, learners of Chinese and French as a second language provide each other with various types of scaffolding aiming at promoting their learning. Teletandem (Telles 2009) is a form of telecollaboration (Belz & Thorne 2006) exploiting desktop videoconferencing (DVC) and based on the tandem method (Helmling 2002), where two learners of different mother tongues cooperatively learn each other's language.

This study is part of an ongoing PhD research. Consequently, this paper lays some articulations leading to a model still under construction.

2. Sociocultural theory

During the last twenty years, sociocultural theory set as a parallel paradigm in the SLA[1] field (Zuengler & Miller 2006). According to this theory, language is an instrument to control one's and others' behavior and to regulate activities. Another central point is that higher mental functions are social in nature, which means that development occurs during (collaborative) activities and proceed from the interindividual, interpersonal plane to the intraindividual, intrapersonal plane.

Within this framework, learners' development is to be conceived not only as the *actual* development, but also as the *potential* development. Potential development, conceptualized by the spatial metaphor of Zone of Proximal Development (ZPD), is defined as:

the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (Vygotsky 1978, 86)

Bruner (1975, Wood *et al.* 1976) and his colleagues, developed this conception. Studying tutoring, they formulated the (again metaphorical) notion of "scaffolding", which is what the tutor does in order to facilitate learner's performance and development during problem-solving tasks.

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[1] Within the sociocultural theory, "second language development" would be a more appropriate denomination. In this paper "SLA" is used as a general term and does not indicate the cognitive paradigm sociocultural theory opposes to.

Despite some similarities between the two notions of ZPD and scaffolding, Bruner's "scaffolding interpretation of the ZPD" is problematic. An extended critic is beyond the possibilities of this paper (see Lantolf & Thorne 2006, 274). We just highlight that in Bruner's scaffolding the tutor-learner relation is one where:

1. the tutor "knows the solution" and how to attain it;

2. the tutor has complete control over the situation; (s)he lets the learner act "freely" only if (s)he thinks the learner is doing right.

That is, despite Vygotsky's ZPD implies a dialectic relation with shared control, this relation disappears in Bruner's scaffolding interpretation.

Moreover, the "application" of ZPD and scaffolding to second language learning contexts is problematic, as it usually implies a limited vision of language (and culture) learning as a rule-governed enterprise only (Kinginger 2002).

Aljaafreh & Lantolf (1994) provide some important steps forward in adapting these concepts to second language learning. Studying individual tutoring sessions where learners have to correct their written productions, they identify a 12 levels scale (see below) characterizing tutor's interventions – which we would call "scaffolding" – from the most indirect and implicit – level 0 – to the most direct and explicit – level 12. This scale is important since:

1. it creates a link between tutor's intervention and learner's ZPD;

2. it introduces a gradual conception of ZPD, and consequently of scaffolding.

FIGURE I
Regulatory Scale—Implicit (strategic) to Explicit

0. Tutor asks the learner to read, find the errors, and correct them independently, prior to the tutorial.
1. Construction of a "collaborative frame" prompted by the presence of the tutor as a potential dialogic partner.
2. Prompted or focused reading of the sentence that contains the error by the learner or the tutor.
3. Tutor indicates that something may be wrong in a segment (e.g.,sentence, clause, line)—"Is there anything wrong in this sentence ?"
4. Tutor rejects unsuccessful attempts at recognizing the error.
5. Tutor narrows down the location of the error (e.g., tutor repeats or points to the specific segment which contains the error).
6. Tutor indicates the nature of the error, but does not identify the error (e.g., "There is something wrong with the tense marking here").
7. Tutor identifies the error ("You can't use an auxiliary here").
8. Tutor rejects learner's unsuccessful attempts at correcting the error.
9. Tutor provides clues to help the learner arrive at the correct form (e.g., "It is not really past but some thing that is still going on").
10. Tutor provides the correct form.
11. Tutor provides some explanation for use of the correct form.
12. Tutor provides examples of the correct pattern when other forms of help fail to produce an appropriate responsive action.

Another important research on scaffolding is the one of Donato (1994). Studying written production in small groups of learners, he observes that even if there is no "expert" in the group, students succeed in producing written texts scaffolding their pairs' performance. Donato calls this "collective scaffolding". This study is important because it shows that even if nobody "knows the solution", students working collaboratively can develop their language proficiency within their ZPD[2].

3. Data

Data come from a Sino-French Teletandem project developed at the Dalian University of Foreign Languages (DUFL, China): Teletandem Dalian (Cappellini & Rivens, *in press*). During Teletandem Dalian, third year undergraduate Chinese students learning French interacted with French native speakers learning Chinese. The total number of sessions was six. Each session lasted two hours, one in French and one in Chinese. Students used different DVC systems, such as Skype[3], Windows Live Messenger[4] and QQ[5]. All these systems have the same basic communicative affordances (see below) of DVC (see Wang 2004a, 2004b)[6], even if configurations change.

Before starting their teletandem sessions, Chinese students had an individual interview with a tutor to fix learning objectives and to consider different strategies to reach them. Another individual interview was arranged at the end of the six sessions to make explicit and formalize linguistic learning and possible changes in cultural representations. The same tutoring sessions were offered to the French participants. Four of them took the opportunity.

The following table provide a minimal description of the pairs analyzed in the present paper, identified by the initials of the partners' names.

Table 1 Participants description

Pair reference	Status of the Chinese partner	Status of the French partner
LF	L: student at DUFL	F: student at Lille Business School
DF	D: student at DUFL	F: student at Lille3 University
LS	L: student at DUFL	S: student at Lille3 University

Chinese students recorded their sessions themselves, after asking for permission to their French partners. They recorded only the French part of their sessions. To record, we recommended to use

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[2] Due to the limits of this paper, we do not take into consideration the usefulness of the studies within a cognitive therotetical framework such as those gathered in Gass 1997. This source will be evident in section 5.2.
[3] http://www.skype.com/intl/en/home
[4] http://www.microsoft.com/athome/photos/imvideo.aspx
[5] http://www.qq.com/
[6] The only exception is the presence of an interactive white board.

Camstudio[7], a dynamic screen capture software. However, since students used their own material, some of them decided to use a different software to record.

Hereafter, we call "language expert" the French speaker, and "learner" the Chinese speaker.

4. Method

This study is a qualitative one. The concepts we use are heuristic. Besides the sociocultural framework described in the preceding section, we adopt an interactionist epistemology as it is described by Hutchby (2001).

Teletandem interactions are characterized by the mediation not only of verbal and non-verbal languages, but also by the mediation of a one-to-one desktop videoconference system. This implies that:

1. interlocutors do not (completely) share space (Licoppe et Relieu 2007);

2. interlocutors acts within a semio-techno-pragmatic system (Peraya 2000).

In order to describe conversation (and *a fortiori* scaffolding) in DVC, Develotte, Kern & Lamy (2011) build on the one hand on the model of mediation(s) in CMC elaborated by Lamy & Hampel (2007, 33), on the other hand on the notion of communicative affordance (Hutchby 2001).

Within the sociocultural genetic method, our study concerns the microgenetic level (Wertsch 1985). More precisely, our object of investigation is scaffolding, that is the language expert's ostensive behavior (Sperber & Wilson 1986), which we will call "intervention", influencing learner's performance and therefore learner's learning. Since we take an interactional perspective, interventions are considered within a larger unit of analysis in interaction: the sequence as it is defined by Schegloff (1972), and more precisely side sequences described by Jefferson (1972). The interventions of the language expert during these side sequences are what we call scaffolding. To describe and to build a model of scaffolding in teletandem interactions we answered the following questions:

1. What are the informative and communicative intentions (Sperber & Wilson 1986) of the language expert's intervention?

2. What is the graduation of the intervention (Aljaafreh & Lantolf 1994)? Is it possible to establish a relation between tutor's scaffolding and learner's ZPD ?

3. Which communicative affordances (Hutchby 2001) are "activated" during the intervention?

5. Case studies and discussion

In this section we consider examples of scaffolding in order to find distinctive features of different types of scaffolding. The examples analyzed are reported in appendix with an English translation.

5.1 Tutorial scaffolding vs communicative scaffolding

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[7] http://camstudio.org/

According to our analysis, in example 1 the language expert understands what the learner is saying and his/her intervention aims at correcting a mistake made by the learner. In other words, the language expert's communicative intention is to make the learner correct him/herself. On the contrary, in example 2 the language expert does not understand the learner at first and this leads to a more detailed explication by the learner. The language expert communicative intention is not to make the learner correct herself, but to ask her for a clarification.

This leads us to the first articulation for a model of scaffolding. During a side sequence, we will call *tutorial scaffolding* one or more interventions by the language expert whose communicative intention is to make the learner perform a more correct or more suitable utterance independently from any communicational problem. In other words, the language expert understands the learner but (s)he wants to make the learner reformulate in a different manner. On the other hand, we will call *communicational scaffolding* one or more interventions by the language expert whose communicative intention is to signal the fact that (s)he does not understand what the learner is saying.

In our opinion, this distinction reflects the fact that in (tele)tandem learning the second language "constitutes the end as well as the means" (Lamy & Hampel 2007, 33) of interaction. We also need to specify that this articulation is not antonymic, which means that even if these two types should be distinguished in a model of scaffolding, in real interaction they could occur in the same side sequence[8], as in example 5 (see below).

5.2 Direct vs indirect scaffoldings

However, this first articulation does not provide any information about the graduation of the language expert's intervention and the possible relation with the learner's ZPD. Following Aljaafreh & Lantolf (1994), we tried to identify a graduation of scaffoldings according to their explicitness or implicitness.

As for tutorial scaffolding, we found four levels. The highest level, level 4, is when a learner's error is explicitly pointed out and corrected by the expert. This roughly corresponds to what was called elsewhere explicit feedback (Long 1996). The second level is slightly more implicit and consists in what is widely known in literature as recast, as in example 1. The third level is when the learner employs two different options, and the language expert picks up one of them, as in example 3. The fourth level of tutorial scaffolding found in our corpus is the most implicit and corresponds to a positive answer by the language expert after the learner asked him if his formulation was right, as in example 4[9].

Concerning the relation between tutorial scaffolding explicitness and the leaner's ZPD, it is important to note that it is not bi-univocal. In fact, if successful scaffolding at the lowest levels could mean that the item was high in the ZPD, scaffolding at the highest levels does not mean the item was low in the ZPD. If tutorial explicit scaffolding arrives after tutorial implicit scaffolding or communicative explicit scaffolding, then the item can be considered to be low in the ZPD. On the

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[8] Due to the limits of this paper we do not take into consideration the case in which a language expert's utterance not understood by the learner leads to a side sequence.
[9] We think other graduations of scaffolding are theoretically possible, but we did not find any example to support them.

contrary, if tutorial explicit scaffolding occurs just after the learner's problematic utterance, we do not have any indication about the position of the item in the ZPD.

As for communicative scaffolding, a distinction between explicit and implicit forms is less evident. In fact, communicative scaffolding is defined as one or more interventions by the language expert triggered by a problem in understanding and pushing the learner to a more understandable formulation. A communicative explicit scaffolding would be a language expert's intervention making explicit the communicational problem. However, the language expert cannot make it explicit, since (s)he have not understood yet. The language expert can make it explicit only after having understood. But if the language expert understands, then it is by definition a case of tutorial scaffolding. This is the reason why we define communicative explicit scaffolding as possible only as a first step to tutorial scaffolding during a side-sequence, as in the example 5.

However, we need to distinguish this communicative explicit scaffolding from the communicative implicit scaffolding, visible in example 2. In this case, the language expert does not know the subject of conversation nor understand the learner's utterance and therefore signals this non-understanding. The learner then reformulates in a more understandable and correct way her utterance. Also, in this case we can safely deduce that the item is high in the ZPD.

Communicative implicit scaffolding reminds of Donato's collective scaffolding since in this case nobody "knows the answer" before. However, the language expert's intervention lets the learner correct himself. As such, we think that communicative implicit scaffolding is a particularly common scaffolding in teletandem interactions, since it is linked to what, in a preceding study, we called crossing expertise (Cappellini & Rivens *in press*), that is the fact that the learner has expertise in the subject of conversation and the language expert has expertise in the language spoken.

5.3 Use of communicative affordances

The last dimension characterizing the study of scaffolding in this paper is the activation of communicative affordances[10]. As Lamy & Hampel (2007) noted, in DVC the main communicative affordances are the video channel, the audio channel, the written channel and browsing, which includes internet navigation and file sending. The video channel allows ostensive behavior produced by postures, gestures and mimics. The audio channel allows ostensive behavior produced by pronunciation, prosody and pace. The written channel allows ostensive behavior produced by written verbal messages and possibly system-generated sounds.

First of all, analysis shows that during scaffolding, the video and audio channels are always activated and used by interlocutors. As for the video channel, this means that while the tutor is not always turned towards the screen during communication, during scaffolding (s)he predominantly is. As for gesture, our corpus confirms that during communication, and *a fortiori* scaffolding, the self-centered gestures occurring during speech production are not made visible to the interlocutor (Cosnier & Develotte 2011). On the contrary, during scaffoldings, interlocutors produce and show the gestures McNeill (1992) defined as iconic, metaphoric and, to a lesser extent, deictic. If posture and gestures occur with verbal communication, mimics and nods can occur independently, as in the

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[10] Due to the limits of this paper we do not elaborate a more comprehensive model including the strategic (Gumperz 1982) use of communicative affordances or the degrees of use (Develotte, Guichon & Vincent 2010).

most implicit tutorial scaffolding or in communicative scaffolding to signal a lack of understanding. Finally, as for the audio channel, analysis showed that this affordance is used to produce "teacherese" during tutorial scaffolding of levels 3 and 4.

Concerning the written channel, it is activated only in tutorial explicit scaffolding (levels 3 and 4), mostly to write vocabulary, but also to write sentences as instances of grammatical structures. Browsing is not very used during scaffolding. When it occurs, it is during communicative explicit scaffolding to attain understanding by means of online dictionaries or images before switching to tutorial explicit scaffolding.

(In)conclusive remarks

In this paper we laid some articulations to build a model of scaffolding during teletandem interactions. A model of scaffolding needs to take into consideration the fact that the foreign language is both the instrument of communication/mediation and the object of learning. This led us to articulate between tutorial and communicative scaffolding. We also tried to create a link between the language expert's scaffolding and the learner's ZPD, which made us articulate between different graduations of scaffolding. Finally we tried to take into account the communicative affordances used during scaffolding, but even if we noted some connections between types of scaffolding and the possible use of some affordance, we have not find yet a comprehensive framework allowing an interpretation more abstract than a case to case description. The construction of this model needs such an improvement, which, we think, implicates an analysis of communication affordances utilization as discourse strategies (Gumperz 1982).

Moreover three other central points need to be dealt with:

- to consider not only scaffolding occurring during the learner's turns but also scaffolding due to a non-understanding by the learner of a language expert's turn;

- to link our model of scaffolding to a model of the competences at work during teletandem sessions;

- to take into consideration the dynamic nature of expertise in (tele)tandem learning beyond the language expertise.

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Appendix

Example 1. Tutorial scaffolding level 3

L[11] : quand il ét- vingt- 24 et sa femme elle était vingt- 24 ans et euh [	
When he was 24 and his wife she was 24 years euh [	
E : elle avait] [sourire]	
she had [smile]	
L : euh oui il avait 24 ans [et sa femme	
euh yes he had 24 years [and his wife	

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[11] L = learner ; E = language expert. In our transcription we do not represent the chat since in the examples we analyze it is not used.

E : [rire]]	
[laugh]	
L : il avait 22 ans ou vingt-trois ans ils sont mariés et	
he had 22 years or twenty-three years they are married and	
[E fait oui de la tête]	
[she nods]	
L : euh ils sons_allés en angleterre [euh	

euh they went to England [euh	
E : d'accord] [elle se remets à côté]	
ok] *[she returns aside]*	

Example 2. Communicative implicit scaffolding

L : parents chinois des parents chinois maintenant ils ils_ont ils_ont aussi décidé la vie de leurs enfants , d'accord tu me comprends ou pas ? [ils décident *now Chinese parents also decided their children's life , do you understand me or not ?*	
E : ouais j'ai pas compris] ta dernière phrase *yes I didn't understand your last sentence*	
L : ils décident la vie de leurs enfants *they decide their children's life*	
E : d'accord ok oui j'ai bien compris *ok yes I did understand*	
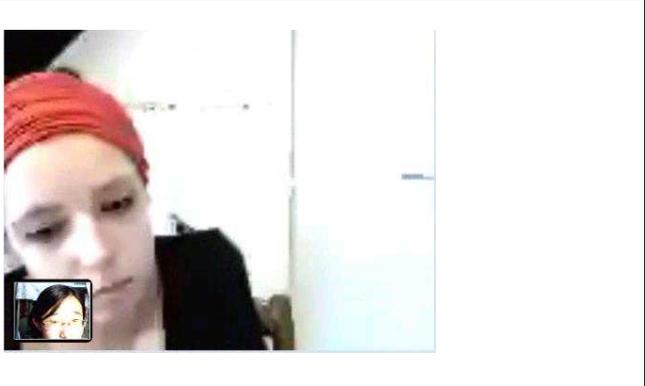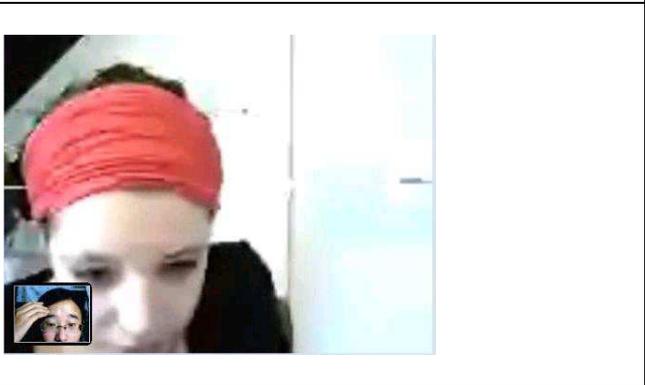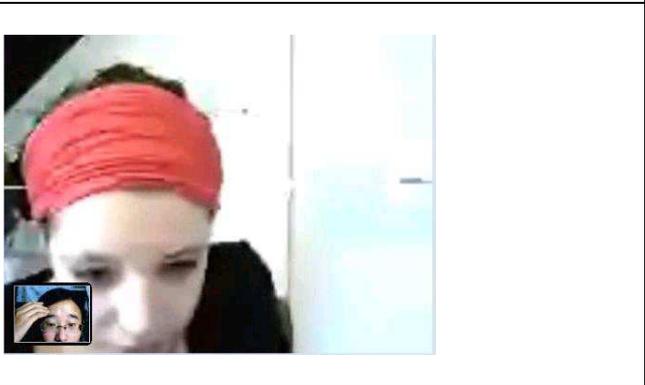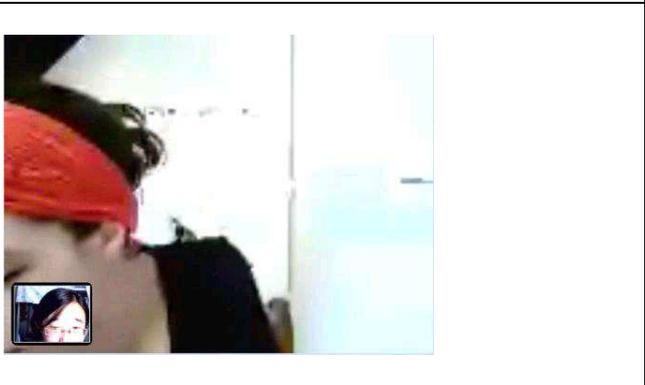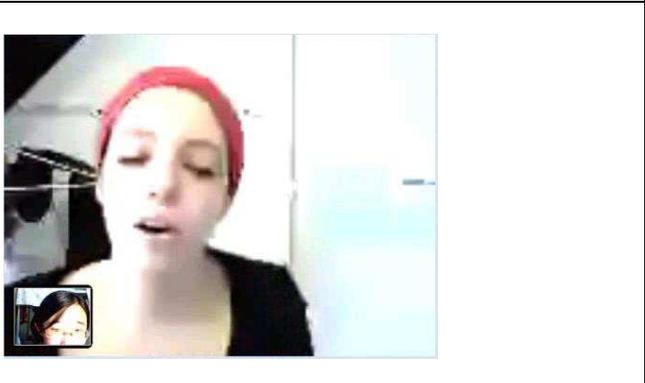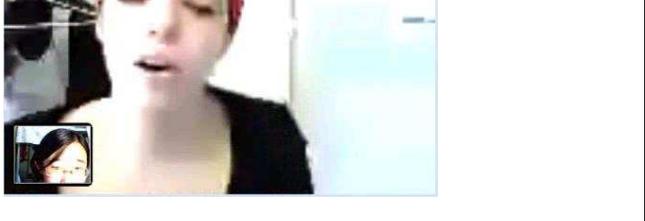
L : d'accord	
ok	

Exemple 3. Tutorial scaffolding level 2

L : chaque jour il il a suivi le cours et avec un bo- euh avec un livre il n'a aucun aucun relation avec le cours donc c'est c'est pas le le livre pour le cours c'est justement un roman ou quelque chose euh euh mais donc il il a lu ces livres et il a écoute euh il a entendu le cours à la fois mais=	
every day he took classes with a bo- euh with a book without any relation with the class so it's it's not the book for the class it's just a novel or something euh euh but so he read those books and he listened euh he heard the lesson at the same time	
E : =écouté . t'avait raison écouter le cours en même temps	
listened . you were right listen to the lesson	
L : [en souriant] oui oui oui écouter le cours	
[smiling] yesy yes yes listen to the lesson	

Exemple 4. Tutorial scaffolding level 1

L : on on , attaque des fils coton [E hausse un sourcil]	
they attach some cotton threads [E raises an eyebrow]	
L : c'est ça fil coton ?	
that's it cotton thread ?	
E : des des fils ouais des fils en coton	
some some threads yes some cotton threads	
L : oui des fils en coton et [les fils	
yes some cotton threads [the threads	

Example 5. Communicative explicit scaffolding

L : je voudrais bien savoir comment on se mar- comment on se marie en france ?	
I would like to know how people get how people get married in France	
E : euh comment on se marie	
euh how people get married	
L : ah [oui	
oh yes	

E : tu veux] savoir comment on demande le mariage ou comment au sens de la cérémonie ?	
do you want to know how people propose or how meaning the ceremony ?	
L : euh , je voudrais savoir quelques choses de euh , produrable ?	
euh , I want to know something about euh produrable ?	
E : de quoi ?	
about what ?	

L : quelques choses de sur le procédure	
something about the procedure	
E : d'accord ok donc la cérémonie , ben quand tu parles de mariage c'est pas la procédure c'est la cérémonie	
ok ok well the ceremony , when you talk about marriage it's not the procedure it's ceremony	
L : ah oui oui oui	
oh yes yes yes	