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L2 Private Speech in Online Dynamic Assessment: A Sociocultural Perspective

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Abstract

Theoretically framed within Vygotskyan sociocultural theory of mind (SCT), Dynamic assessment (DA) is a new approach to classroom assessment offering mediation to help learners perform beyond their level of independent functioning. As a web-based qualitative inquiry into the nature of mediation in DA and its impacts on the participants' private speech patterns, this study explored the role of private speech as a social and psychological tool to mediate learners' thinking and performance in online DA. The subjects of the study were two Iranian university students along with two English native speakers orally narrating a series of picture stories and having weekly DA mediation with the researcher via Skype. In the present study, the students' private speech markers' typology emerged out of thematic analysis of oral narratives transcribed before and after DA mediation and it was presented as a criterion to evaluate the learners' progression towards self-regulation. The frequency of occurrence of the learners' private speech markers was reported and interpreted based on the emergent typology to evaluate the possible changes in their use as the result of DA mediation. Meanwhile, the differences between native speaker participants and the learners' use of private speech markers in oral narratives were highlighted and discussed. The results of the

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study indicated that mediation was effective in reducing the number of private speech markers in the learners' narratives after mediation which reflects their progression towards self-regulation in online DA. The findings of the study highlight the importance of private speech as a mediating tool in DA which reflects learners' struggle to take control of direction of learning and move beyond their current capabilities.

Key words: Private speech; DA; Mediation; Sociocultural theory

Introduction

Theoretically originated from the works of Vygotsky in general and his concept of zone of proximal development (ZPD) in particular, DA focuses on a learners' potential for learning and foregrounds future development and is opposed to non-dynamic assessment (NDA) that focuses on learned products (Lidz, 1987). The potential level of development pinpoints the abilities that are in the process of maturation and is associated with the ZPD. In DA sessions mediation is provided through "the mechanism of effective help" which requires that assistance provided to learners be graduated, contingent, dialogic and tailored to the learners' ZPD (Aljaafreh & Lantolf, 1994, p.468). To generalize the effect of mediation to hypothetical situations, transcendence (TR) activities which include new tasks carried out collaboratively between the learners and the mediator are introduced (Poehner, 2007). DA implements microgenisis as the general analytical framework to investigate the level of self-regulation in learners' development. The microgenetic method "primarily concerns the reorganization and development of mediation over a relatively short span of time." (Lantolf, 2000, p.3)

In Vygotskian SCT language functions as the most important mediating symbolic tool in the transformation of learners' cognitive development. Vygotsky (1978) argued that in children this transformation is facilitated by the use of egocentric speech which has a self-regulatory function. The term private speech which is now widely used in the literature was originally coined by Flavell (1966) to account for Vygotsky's notion of egocentric speech. As a means of self-regulation, private speech mediates one's thinking in what Vygotsky referred to as the higher mental functions such as voluntary attention, planning, intentional memory, logical thought, problem solving, evaluation, and learning (Lantolf, 2000).

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Although the role of private speech representing the progression from other to self-regulation in the social interaction has been investigated in the literature (Appel & Lantolf, 1994; Centeno-Cortes & Jimenez Jimenez, 2004; Frawley, 1992; Lantolf & Frawley, 1985; McCafferty, 1992; Ohta, 2001), to the best of the researcher's knowledge, the relationship between mediation and private speech in online DA has not been fully explored from a sociocultural perspective.

Review of Related Literature

A Sociocultural Perspective on Private Speech in SLA

In his experimental studies with children in Russia, Vygotsky (1986, 1978) noted that when confronted with demanding cognitive tasks children addressed themselves spontaneously and invoked private speech to overcome difficulties. Vygotsky (1986) argues that private speech helps children in planning the solution of a problem and is considered as the convergence of thought and language. He described private speech as self-directed activity emerging as children try to self-regulate their behavior. Lee (2008) defined self-regulation as "internally oriented voluntary regulation that characterizes higher mental functioning; self-regulation is in evidence when a skilled individual is capable of autonomous functioning " (p.171).The main use of private speech in both L1 and L2 has often been described as self–regulatory (Frawley & Lantolf, 1985; McCafferty, 1992, 1994; Ohta, 2001; Wertsch, 1985).

Following Vygotsky, Wertsch (1985) argues that prior to the advent of self-regulatory private speech in children, "behavior is being guided by phenomena in the physical environment which attract the child's attention" (p. 90). This is termed object regulation which appears in the early use of private speech in children for describing and naming objects, actions and environment rather than planning on task performance. At the second level just before the use of private speech as a means of self-regulation children experience other-regulation level at which they are guided through goal-directed activities by significant others such as adults and teachers. Eventually, they manage to function independently through self-regulation. They become capable of appropriation of thinking skills and can consequently plan, guide and monitor their own activity.

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Inspired by Vygotskyan approach to second language learning, Frawley and Lantolf (1985) pioneered the investigation of the role of private speech in second language. They point out that because of the lack of mastery and difficulties they face in task performance, especially at lower levels of proficiency, second language learners resort to private speech to mediate their self-regulation. Frawley and Lantolf cautioned that as private speech is highly context-bound, even native-like L2 learners are always self-regulated through the continuous access which has been described as the capacity of human mind to reaccess the earlier stage of development later in life. They point out that "an adult is not an autonomous, finalized knower, but an organism which recovers and utilizes earlier knowing strategies in situations which cannot be dealt with by self-regulation alone" (p.22). They conclude that private speech does not progress in a linear fashion, there is no point in which learners' use of private speech ends and no one can be completely self-regulated in all situations.

Centeno-Cortes and Jimenez Jimenez (2004) investigated the role of private speech in Spanish learners at different levels and problem-solving tasks by Spanish native speakers. They conclude that "L1 private verbal thinking plays a crucial role in the case of L2 speakers engaged in problem-solving, and therefore it should be recognized as very important in the process of learning" (p. 31). They further maintain that in the second language context, the appearance of L1 in the private speech of L2 learners highlights the importance of L1 in their L2 cognitive processing.

Centeno-Cortes and Jimenez Jimenez (2004) point out that despite being more abbreviated than social speech; private speech is social and communicative in nature. It is psychological in function; that is, in private speech the speaker and listener are the same. Lantolf (2000) points to the elliptical quality of private speech as development progresses. He maintains that children and adults use private speech as a means of self-regulation when confronted with difficult tasks. Smith (2007) emphasized the key role of private speech in cognitive development, indicating that "social interaction is the genesis of individual cognition, and private speech is the use of externalized language by an individual as a social semiotic tool, appropriated within social contexts" to regulate cognitive functions (p. 342). At the same time private speech represents symptoms of the progression from other to self-regulation in the social interaction which forms the basis of dynamic

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assessment in which learners and the mediator are engaged in a dialogic interaction to help them towards self-regulation in their ZPD.

In the Japanese EFL context, Ohta (2001, cited in Smith, 2007) investigated the patterns of private speech of Japanese second language learners at a university classroom. She reported the students' repetition, linguistic manipulation and vicarious response as forms of private speech in her data. Ohta argued that the use of private speech is a part of the internalization process when learners attempt to use the social interactive resources of the L2.

To appreciate the process-based nature of DA, this study investigated the social and psychological mediating tool of private speech to shed new light on the learners' microgenetic development in both intermental and intramental planes. For uncovering the patterns of private speech markers the development of a typology of private speech markers was needed as a criterion to evaluate the learners' progression and movement towards self-regulation in online dynamic assessment. The categories of private speech markers emerged out of a thematic analysis of transcripts of oral narratives of the learners in online context on the basis of which the impact of DA mediation was interpreted. The following question guided the study:

How does mediation in online DA impact L2 learners' use of private speech as a mediating tool in their development?

Method

To develop a firm understanding of the qualitative data obtained, the thematic analysis was applied for encoding the patterns of learners' private speech markers before and after mediation in online DA. The researcher used snowball or chain referral sampling which is a nonrandomized purposive sampling to recruit participants not easily accessible by the researcher. Two Iranian university students residing in UK and France along with two English native speakers were recruited. As the participants of the study were geographically dispersed, Skype, a free online phone service, was used to provide live oral mediation and prompts in DA and transcendence (TR) sessions. During DA sessions, the learners and the mediator worked dialogically on a series of picture stories and video clips to promote their cognitive functioning of the target structures which proved problematic in NDA sessions. The dialogic mediation in this study was based on the principles of interactionist DA, i.e., the mediation emerged out of the cooperative dialoguing

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between the mediator and the learners. Then, to evaluate the learners' level of internalization and ability to extend DA mediation to new and more challenging contexts transcendence (TR) was employed.

The participants had one-to-one individual weekly DA sessions on oral narratives of some picture stories and video clips selected for non-dynamic, dynamic and transcendence sessions over Skype for a period of two months. Two native speaker participants took part in oral narratives on the basis of which non-native participants' patterns of private speech were compared and contrasted. To document the data collection procedure, Skype mp3 call recorder was employed for audio recording of oral narrations. The data were collected in the following stages: First, participants in the study were prompted to present their oral and written narratives of a series of picture stories and short video clips in two non-dynamic assessments as pretest in which their patterns of private speech, and grammatical problems were revealed and became the target of mediation in DA and transcendence (TR) sessions. For the picture stories, participants were asked to narrate the set of pictures one frame at a time without being allowed to see the next frame. The choice of picture story was partly motivated by Frawley and Lantolf's (1985) argument that presenting stories in different frames would make them challenging for second language learners and consequently provoke different forms of private speech in their oral and written narrations. It is argued that private speech might help uncover the structural problems in narration which can be targeted by mediation in DA. Second, learners and the mediator worked together through the mediation procedure which is explained in details in (Birjandi & Ebadi, 2012; Ebadi, 2013) with the aim of promoting cognitive development of the target structures. Third, learners worked through the same assessment tasks as in the initial pre-test assessment in the third stage as post-test after DA mediation. Later, students and the mediator engaged in transcendence (TR) based on similar tasks as in DA but in more challenging contexts within a week period to investigate the possible impacts of DA on the changes of their patterns of private speech. The oral narratives of NDA, DA and TR sessions were transcribed and a typology of private speech markers emerged out of the thematic analysis of data on the basis of which the frequency of occurrence of categories for each participant was reported and interpreted to evaluate the impact of mediation on the changes in his/her private speech as an indicator of progression toward self-regulation for the target structures.

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Data Analysis

Darhower (2002) indicates that data reduction is necessary to maintain consistent and systematic data analysis. Reduction was achieved by the selection of language related episodes (LREs). Swain (2001) described Language Related Episode (LRE) as ‘‘any part of a dialogue where students talk about the language they are producing, question their language use, or other- or self-correct their language production” (p. 287). After reducing the raw data into LREs for mediation between learners and the mediator and coding the data, reports were generated for the patterns of private speech markers before and after mediation. The descriptive statistics were run to analyze the frequency counts of private speech markers in the learners' oral narratives throughout DA and TR tasks.

The development of a typology of private speech markers was needed as a criterion to evaluate the learners' progression towards self-regulation. The researcher utilized a hybrid approach combining a prior-research-driven approach in which codes used by other researchers and their findings are used to guide the new research and data-driven approaches to generate themes in learners' private speech. For this purpose, Frawley and Lantolf's (1985) formulation of the three categories for the classification of forms of private speech, i.e., object, other, and self-regulation which were inspired by Wertsch's categorization of children's L1 private speech was utilized as the main general framework for data analysis. Although private speech in this study is framed within Lantolf and Frawley's categorization, some other categories emerged out of thematic and microgenetic data analysis which were in line with categories reported in relevant studies on private speech in SLA (Macraffy, 1994).

Even though the researcher basically agrees with Frawley and Lantolf's (1985) argument that inferential statistical analysis is mostly based on mean differences that obscures individual variation and as such should not be used to analyze private speech which is highly individualized, they found that some frequency figures of the manifestation of private speech markers in online DA would provide some general ideas as to the nature of this phenomenon.

Results and Discussion

Private Speech Markers

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The effect of mediation on the progression from object-regulation to self-regulation in the learners' ZPD was investigated and the following categories of private speech markers (Table 1) emerged out of a thematic analysis of transcripts of oral narratives of the learners in online DA. On the basis of the emergent typology on private speech markers, the frequency of occurrence of categories for each participant was reported and interpreted to evaluate the impact of mediation on the changes in his/her private speech as an indicator of progression toward self-regulation for the target structures.

Table 1
Private speech markers emerged out of thematic analysis of data

Object-regulation	**Other-regulation**	**Self-regulation**
1. Perspectival markers	1. Question asked from self	1.Suddenly understanding and
2. Adding extra information	2.Question asked from other	mastering a problem
3. Unfinished sentences		
4. Self-comments		
5. Repetitions		
6. Switch from L2 toL1		
7. Affective markers		
8. Tense and Aspect		

Transcription conventions**: ..** Pause,**…** Long pause,**….** Longer pauses, **Bold:** Private speech markers

Following Frawley and Lantolf's (1985) categorization of private speech, the present typology was divided into three general categories of object-regulation, other-regulation and self-regulation.

Object-regulation

Lantolf and Frawley argue that L2 learners attempt to divide difficult tasks into their component parts to gain mastery and make the tasks known to themselves. This indicates the extent to which the tasks remained beyond their grasp. McCafferty (1998) points out that although there are many linguistic realizations of object-regulation, "this category essentially refers to an orientation by the learner that reflects his or her preoccupation with gaining control through a focus on the

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structural features of the task or the L2 itself" (p.76). The following linguistic realizations of object-regulation emerged out of the data:

Perspectival markers

Following McCafferty (1994) perspectival markers were considered as a means of object regulation because learners narrate the story from their own temporal perspective at the time of narration of the pictures not relating events from inside the story, as it is illustrated in the following excerpts:

1. ***Ok I see the young man*** *staying beside of the bridge (Sepideh, TR1)*
2. *The* ***mouse is standing and waiting for*** *something* ***I think*** *(Sepideh, NDA)*
3. ***I see*** *a mouse behind the stone.(Dara, DA)*

Adding extra information

In this category, learners provided background for the setting and characters, or adding other information not found in the story to exercise control over the language and compensate for the lack of linguistic competence.

4. ***After many years*** *we saw the picture the woman and the dog (Dara, TR1)*
5. *The lion says thanks for your help* ***I am sorry for my act****…(Sepideh, NDA)*

Unfinished sentences

Centeno-Cortes and Jimenez Jimenez (2004) consider breakdowns in the thinking process as realized through the use of fragmented and unfinished sentences as forms of private speech. As demonstrated through the following excerpts unfinished sentences indicate the problematic areas in which the learners mostly changed the topic or simply did not continue their narrative because of lack of mastery on the relevant structures to complete their sentences.

6. *Mr Been* ***is ……****this story is about Mr. Bean.(Sepideh, RT2)*
7. *This movie was* ***about, eee….*** *about ..eee… .(Sepideh, RT2)*

Self-comments

The learners commented on their task performance and remarked about the facts in the pictures as object-regulation to understand the discourse structure**.**

8. *Yeah uhh,* ***I don' know what's in hand of the lion? (****Sepideh,*

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NDA)

9. ***In my idea*** *he is not funny (Dara, TR2)*
10. ***I don't know*** *what he wants to do (Sepideh, NDA)*

Repetitions

The learners used repetition as one of the most frequently used private speech markers tto maintain focus on problematic structures and to exercise control over their performance. This corroborates Ohta's (2001) finding in which she reported that repetition was most commonly used by the learners in their FL private speech. Repetition as a means of object-regulation highlights the source of difficulty that the learners struggle which needs further mediation in DA.

11. ***Remember*** *I can swim, and* ***I can swimming. I can swim****ming.(Sepideh, TR2)*
12. *Ah ,the lion,* ***the voice the voice lion, the voice's lion****.(Dara, SA)*
13. *The lion's voice* ***the lion's voice, the lion's voice is on to the forest****.(Dara, NDA)*
14. *Finally he takes the dog and try to swim* ***avec the…with*** *the dog toward the land.(Dara, TR1)*
15. ***A lion is …a lion*** *is in the picture (Sepideh, NDA)*

Switch from L2 to L1

The importance of L1 in L2 cognitive processing has been emphasized by different studies in the literature (Anton& DiCamilla, 1998; Swain & Lapkin, 2000). This category represented learners' switch from L2 into L1 during their oral narratives of the stories. As it is demonstrated in the following excerpts, L1 surfaced in the private speech of L2 learners when faced with difficult structures to fill in the gaps in l2 knowledge. They mostly used L1 to ask questions from the mediator to search for vocabulary meanings and focus on grammatical forms to overcome their problems. This highlights the fact that private speech can be both self-regulatory and a social request for guidance at the same time.

16. *Ahaaa, they talk together, they're talking together****..(hale sade nemishe?..)(****Is simple present OK?) (Dara, NDA)*
17. *She wants to help it but she can't because the* ***(pol?)*** *what's the meaning of (bridge)? (Dara, TR1)*
18. *This is the photo of the dog after the* ***(nejat chimishod?)****(what was the meaning of rescue)(Dara, TR)*

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Affective markers

Externalization of affective markers was used when learners engaged in task performance or expressed remarks about the content of the story. The affective markers include sighs, laughter, and exclamations which were used as learners reactions to dramatic scenes within the stories. McCafferty (1994) argues that affective markers are a type of predication that result from object-regulation. The data evidenced that some learners tended to use more affective markers as a means of object-regulation than others. The reason might be due to their psychological orientation or the nature of task at hand. Some stories which included some emotional scenes prompted more affective markers. Centeno-Cortes and Jimenez Jimenez (2004) point out that exclamations of frustration and sighs of irritation are different patterns of private speech produced by the subjects while engaged in problem solving tasks.

19. ***Ahaaa (laughs)****the mouse tries to run… but impossible (Sepideh , NDA)*
20. *They succeed… haaa (laughs) and the lion aaaa* ***(laughs)*** *is free.(Dara, NDA****)***
21. *She, she cried… and* ***mmmm… aaaaa….*** *And (****baghal kardan****)(Hugs)* ***(****Dara, TR1****)***

Tense and aspect

Frawley and Lantolf (1985) include selected "extra textual" elements such as forms of tense and aspect as private speech patterns. Macaffery (1992) and Frawley and Lantolf reported that native speakers often used the historical present tense to relate their narratives. Frawley and Lantolf consider both past tense and progressive aspect to be used by learners to gain control over the macrostructure of the task through regulating the temporal framework of events and thus to be forms of object-regulation.

Because of the learners' lack of control over the temporal relations between events in the story, past tense was used which allowed them to consider events as completed acts. Consequently, using past tense removed the sense of immediacy as a source of difficulty for them at this stage to gain necessary distance to self-regulate. On the contrary, progressive aspect provided a sense of immediacy which called for objectification of stimulus as unrelated events. The resulting narrative lacked coherence as the learners portrayed events as completely isolated and separated from each other. (See Figure 1)

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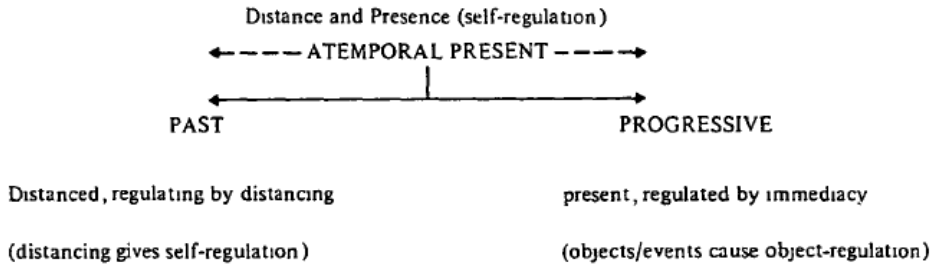


Figure 1: Self-regulation from distance and presence point of view Frawley and Lantolf, 1985, p.34

Following Frawely and Lantolf, to support the claim that L2 learners use odd forms of tense and aspect as object-regulation in their narratives, two native speakers of English narrated the stories to highlight the difference in tense and aspect in both native speakers and L2 learners' oral narratives. In the following excerpts both Tom and Evan used historical present tense in their narrations which corroborates Lantolf and Frawely's (1985) findings in which they claimed native speakers tend to use historical present instead of past or progressive tenses in their narrations.

Tom (TR1)

22. *Well, she can't throw a life boat down there because the dog's not gonna grab hold until she comes down into the water. So I think because there is a bad--- between the jetty and the water, her only option is to walk down the jetty and carry the dog towards the shore or swim towards the shore or else. It looks… right. I have a very, very close-up of a dog.*

Tom (NDA)

23. *Ok. Ok, then, right, now we have a picture and in the full ground is what looks like a mouse. ---the resolution is a bit crappy, it's coming in now, it looks like a mouse's head and it must be hiding behind a rock or a small ----. And it's just, uh, looks like it's gonna be moving from the center of the screen towards the left, in the background there is a jungle.*

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Evan (DA)

24. *Alright…uh…there is a farmer who has a bag of pears and he goes out to…uh…you know pick his crop. It looks like a very good pear season and he's out there gathering his pears with his traditional apron or where he puts the pears and climbs the tree and…uh…he's back. He walks back to the basket and…uh… he's taking the pears out of his…uh….his apron and put them in basket.*

The tense and aspect subcategory of Frawly and Lantolf's categorization of private speech markers in SLA was challenged by the following data from native speakers' narratives in this study. As can be seen both Tom and Evan used past tense not as means of distancing of events but rather simply to relate the relationship of one event to another based on the sequences in the story. Therefore, it is argued that the nature of tasks and events sequencing would determine the use of past tense to a large extent even by native speakers.

Tom (TR1)

25. *Oh, we have quantum leaps here. How did he get out of the water? Did he climb the edge of the jetty or did he go to the, uh, to the shoreline where the jetty is …… I think he must have gone towards the shoreline where the jetty is ---- of the rocks.*

Evan (DA)

26. *And…uh…he walks right by the baskets of pears with the goat and the goat, you could see had a look over the pears and probably wanted one because they're probably delicious pears. And…uh, but you know the guy had it by the neck was…uh was a rope so just kept walking past the pears and didn't say anything. And then it showed the farmer up in the pear trees picking more pears.*

The use of progressive aspect was more prevalent among learners of lower proficiencies the reasons of which might be due to their inability to find adequate means of expression in the target language. Dara's narrative of TR1 is almost entirely marked by the use of progressive aspect in the following excerpt:

27. *One of help the people is taking photograph from the dog and one of the people is thinking about going, falling into the sea and rescue the dog. He is thinking maybe he can rescue the dog.*

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28. *One of the men is going to, to go the sea and rescue the dog. and the dog is approaching the man and she is thinking about , she's approaching to the dog*

More proficient learners used past tense more often in their narratives which can be explained by the fact that they were linguistically competent enough to deal with individual frames in the stories. As a matter of fact, they presented the stories as finished products to have the required distance to connect the dots in a coherent narrative. The following excerpt by Sepideh's narrative in a DA session highlights this issue:

29. *Ok, the gardener was picking pears from…and putting them in a basket cheerfully. The boy came with his bicycle to help the gardener. He took a basket of pear, and eh…he took a basket of pear. In the way his half job done and he lost his control and fell on the ground.*

After their first narratives of the stories, to find out about the impact of mediation on the use of tense and aspect in the learners' narratives, they were required to listen to the recorded native speakers' account of the stories via Skype's audio application. They were particularly directed to pay close attention to tense and aspect used by native speakers. Some of the participants managed to use atemporal tense which reflects their level of self-regulation as it illustrated by the following piece in which narrated TR2 story after listening to Tom's narrative:

30. *By his sound… yeah… afterwards he goes to exhibition, and looks at photos, and bothers one of the viewers… in a funny way, he goes to… he goes to another room and looks at stamps and then have a look at writing and… [eee] sorry… have a look at… [eee] have a look at… writing of one of the… the writers and tries to disrupt and tries to disrupt him, and in another room he sees a woman who touches a pillar, he touches the pillar [aaa] the same as woman but nothing happens, except his hands produce strange voice and becomes… and become [eee] magnetic…*

In the meantime, even after listening to the native speakers' oral narratives, Dara continued to use odd tenses as a means of objet-regulation. This indicates his lower ZPD level towards self- regulation of tense and aspect. Similarly, Sepideh in TR2 experienced the same problem as Dara in the previous episode:

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31. *After that he is going out and wants to, he wanted to go out but there is no, there wasn't any car and he wanted to open the door, but he couldn't. he was … and… he was…there's no any car and he back, he back and is looking at some swiss---- and he went to, he went to swiss and paid money for swiss and he is starting to eating… suddenly the…*

Other-regulation

Following Macaffery (1994), the other-regulation category was divided into two sub-categories. The first one included questions addressed to the researcher when faced with problems in their narratives. The second category was made up of self-directed questions, the answers of which were not sought by the learners. They were used to concentrate more on the important information or problematic areas as illustrated in the followings:

32. *He catches this lion in this I don't know **what's its name**?(Sepideh NDA)*
33. *But suddenly [eee] the lion [eee] … oh, **what happened?**… oh the lion gets up. **(** asking question from self) (Sepideh, NDA)*

Self-regulation

This category represented the learners' automatic detection, understanding and mastery of the source of difficulty while performing a task. Anton and DiCamilla (1998) describe self-regulation as internally self-generated cognitive plan which does not reside neither in object-regulation nor other-regulation. They also point out that self- regulation is realized through interaction with others in one's culture which is primarily mediated by language. Anton and DiCamilla believe that it is not a complete entity in itself but rather relative to the task and it is subject to change. This category was more frequently used in TR sessions after incorporating the mediation provided on target structures in previous DA mediation as an indicator of the level of progression in ZPD for a particular target structure. The data evidenced that self-regulation is never complete and it involves backsliding and regression at times, as it illustrated in the following excerpt:

34. ***There was some there were** some there were some soldiers – in the street(Dara, TR2)*
35. *And **he gets, ohh, he got** surprised that (Sepideh, TR2)*
36. *When the man is, **picks uhh is picking** (Sepideh, DA)*
37. *It goes under the bridge **without..move.. without moving** (Dara, TR1)*

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In the following two examples, Dara used French as a means of self-regulation in learning English. It highlights the fact that self-regulation might be done in different languages depending on the nature of task:

38. *There is the beach…**non excuzes-moi excuses-moi,** there is a very tall building outside the river.(Dara, TR1)*
39. *I see a woman ….**avec.. with ee excuzes-moi** with a t-shirt. (Dara, TR1)*
40. *He wants to relax **on the garden in the garden** (Sepideh, SA)*

As it was illustrated in the above examples of private speech markers, different categories emerged representing various ZPD levels of the learners. The private speech markers' typology serves as the baseline for the next section's analysis of the interactions between the mediator and the learners in online DA.

Learners' private speech markers profiles

The following tables illustrate the number of private speech (PS) markers used by the learners in two oral narratives one before DA mediation and the other after mediation within one week period. Although mediation in DA has been effective in reducing the numbers of PS markers in NDA2, DA1 and DA2, the number of PS markers remained constant or increased in TR tasks which were inherently more challenging for the learners. This confirms Vygotsky's (1978) hypothesis that learners invoke more PS markers when faced with more challenging tasks.

What made Dara's profile stand out is his regular use of affective markers as a means of object-regulation to gain control over task performance. He often reacted emotionally to the unfolding events in the stories particularly in TR session in which he sympathized with a sinking dog. As he lacked enough linguistic abilities to express his emotions in L2, he relied more on the mediator as a resource to solve his problems. Because of his very limited vocabulary repertoire, he often switched to L1 to ask for the meaning of unknown vocabularies to present the stories. At the time of data collection, he studied in a university in which the medium of instruction was French. While attempting to self-regulate, he switched to French to control the task performance. This phenomenon requires further exploration to determine which language(s) multilinguals use to self-regulate in their private speech.

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Table 2
Dara's PS profile

Dara	NDA1	NDA2	DA 1	DA 2	TR1	TR2
Perspectival markers	11	1	3	1	1	3
Adding extra information	1	1	0	0	0	0
Unfinished sentences	3	2	0	0	0	0
Self-comments	0	0	0	0	0	0
Repetitions	15	13	6	7	6	2
Affective markers	2	3	1	2	1	4
Switch from L2 toL1	8	2	11	5	9	3
Tense and Aspect	14	3	6	4	4	3
Question asked from self	1	0	0	O	0	0
Question asked from other	9	2	15	6	9	4
Self-regulation	7	3	4	2	4	5

Sepideh's PS profile is marked by unusually high frequencies of repetitions which sometimes caused communication breakdowns. This might be the result of her lack of familiarity with the Web context which she was not accustomed to for audio chatting. Later, she said that she repeated the words to make sure that the mediator heard all of them clearly. There might be a link between the repetition and short-term memory capacity which requires further research to come up with a conclusive link between the two.

Table 3
Sepideh's PS profile

Sepideh	NDA1	NDA2	DA1	DA 2	TR1	TR2
Perspectival markers	0	4	2	1	0	4
Adding extra information	0		8	1	3	2
Unfinished sentences	3	4	2	5	5	5
Self-comments	1	0	0	0	0	0
Repetitions	6	16	24	7	26	10
Affective markers	0	0	0	1	0	2
Switch from L2 toL1	4	1	2	2	2	4
Tense and Aspect	4	0	17	4	1	3
Question asked from self	0	1	0	0	0	0
Question asked from other	1	1	2	1	2	5
Self-regulation	2	4	9	3	5	3

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As shown in the tables (2 & 3), the frequency of occurrence of object-regulation markers is higher than those of other and self-regulations. This was partly expected because of the way stories were presented in picture and movie frames displayed one at a time which made them more difficult for the oral narratives. Although this method of story presentation was biased towards object regulation, it is justified by the researcher's intention to illicit more PS markers from the learners in their oral narratives in online context.

Apparently mediation had an adverse effect on repetition as a PS marker in learners' second narratives. The number of repetitions increased after mediation in both cases regardless of ZPD levels. It seems to be paradoxical but in reality repetition as a PS marker served double functions in the learners' narratives. In the narratives prior to mediation, it highlighted the problematic structures that the learners struggled with and helped the mediator to find out more about these areas of concern. In the narratives after DA mediation, the increase in number of repetitions reflected learners' attempts to incorporate the mediation which has not been fully appropriated and needed more attention and mediation on part of the mediator. In both instances repetition could be used as a valuable tool to pinpoint the sources of difficulty in the learners' narratives. The study evidenced that repetition was one of the most frequently used private speech markers to create psychological distance between the learners and their linguistic problems in online context. This corroborates Ohta's (2001) finding in which she reported that repetition was the most commonly used by the learners in their private speech in EFL classroom Generally, PS markers can be used as an evaluation criterion for the effect of mediation on the learners' progression towards self-regulation in their ZPDs.

The tense and aspect subcategory of Frawley and Lantolf's (1985) categorization of private speech markers in SLA was challenged by the data from native speakers' narratives in this study. Both Tom and Evan used past tense not as means of distancing of events but rather simply to relate the relationship of one event to another based on the sequences in the story. Therefore, it is argued that the nature of tasks and events sequencing would determine the use of past tense to a large extent even by native speakers. The use of progressive aspect was more prevalent among learners of lower proficiencies because of their inability to find adequate means of expression in the target language.

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The other- regulation category characterized by the learners' questioning from the mediator along with self-directed questions when faced with problems in their narratives. This general category mainly used in DA sessions in which learners used the mediator as a resource to fill in their L2 linguistic gaps. The self-regulation category represented the learners' automatic detection, understanding and mastery of the source of difficulty while performing a task. Interestingly, self-regulation as a private speech marker was widely practiced as the most explicit form of mediation move in online DA. The visual saliency of online context might play a role in this regard. This category was more frequently used in TR sessions after incorporating the mediation provided on target structures in previous sessions as an indicator of the level of progression in ZPD for target structures. The data evidenced that self-regulation is marked by occasional backsliding and regression.

The learners' private speech profiles indicated that although mediation in DA has been effective in reducing the numbers of PS markers in NDA2, DA1 and DA2, the number of PS markers remained constant or increased in TR tasks which were inherently more challenging for the learners. This confirms Vygotsky's hypothesis that learners invoke more PS markers when faced with more challenging tasks.

The data in this study evidenced that PS markers can be used as evaluation criteria to show the effectiveness of mediation in online DA. The study corroborates the findings of the previous studies on private speech (Frawley & Lantolf, 1985; MaCcaferty, 1994) which claimed that with advancing degrees of proficiency there is a diminished need for the use of private speech. It highlighted the fact that mediation in online DA has been effective in reducing the number of PS markers in the learners' narratives after mediation which indicates the learners' progression towards self-regulation in their ZPDs.

Conclusion

The frequent use of private speech markers in online DA mediation particularly by low-proficiency learners indicated their struggle to take control of the target structures. In the classroom context, private speech use by the learners may reveal the focus of their thinking and the direction in which it moves forward. Private speech represents the use of language as a mediating tool in the process of learning. Therefore, Donato (2000) calls for the teachers' awareness of the learners' need for

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self-mediation and holds "a learner's seemingly incomprehensible utterances can serve as a cognitive tool for mediating and navigating a learner and teacher to eventual shared understandings" (p. 33). In a similar vein, Ahmad (1994) proposes that the learners' self-regulatory private speech should not be cut off because of its apparently odd form. Instead teachers should provide psychological and social spaces which are conducive to the use of self-regulatory processes. As it was demonstrated in the study, L1 surfaced in the private speech of L2 learners when faced with difficult structures to fill in the gaps in l2 knowledge and was catalogued as a private speech marker. Thus, the use of L1 as a mediating tool for meaningful L2 processing should be encouraged.

A potential limitation of this study is the small sample size. This is, in part, the result of logistical constraints such as limitations on access to broadband internet and the availability of participants that were outside the control of the researcher. However, the qualitative nature of this research with its emphasis on the behavior of individuals and small groups precluded the use of a large sample. As with any qualitative research study, the external generalizability of the findings may be limited, as there remains the possibility that the research undertaken in different circumstances could produce varying results.

The effect of learners' individual differences on the use of different private speech markers in DA mediation is an area which has been under researched. The link between learners and the mediators' motivation and the use of private speech in DA needs further explorations. Although presenting the emergent typology of private speech markers shed new light on the effect of mediation in in online DA in virtual classroom, much still needs to be done by different researchers in various online contexts such as blogs and wikis to further explore this issue.

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