

## EXPLORING *DIALANG*'S DIAGNOSTIC FEEDBACK IN ONLINE L2 DYNAMIC ASSESSMENT

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### **Abstract**

Dynamic assessment (DA) as an alternative to psychometric-based testing focuses on the collaborative dialogue between the learners and the mediator to move the learners from their current capabilities. This study represents a web-based qualitative inquiry in online DA which aims at addressing the inadequacy of the diagnostic feedback of the web-based *DIALANG* test in reflecting learners' potentials for future development. Applying microgenetic analysis as the general framework for data analysis, this study intended to uncover two university students' zone of proximal development (ZPD) of English grammar structures through mediation in a synchronous computer mediated communication (SCMC) context. The findings of this study revealed the shortcomings of *DIALANG* test results and diagnostic feedback, which are not attuned to the learners' ZPD, and the effectiveness of online DA mediation, which can highlight the learners' microgenetic developmental trajectory to obtain a richer and more accurate understanding of the learners' potential level of future development.

**Keywords:** dynamic assessment, mediation, SCMC, ZPD, *DIALANG*

### **1. Introduction**

The evolution from computers to the World Wide Web and recently to SCMC, which are sophisticated cultural tools which allow for learners' full participation in collaborative environments, lends support to Vygotsky's idea of development emerging from collaborative interaction. The increasing popularity of the Internet made linking of people through social networking a reality.

Assessing learners' progress in the socially-distributed dynamic virtual context of SCMC calls for a new approach to assessment based on close collaboration and two-way interaction in an SCMC context via the Web. Vygotskian dynamic assessment focusing on the process rather than on the product seems to be congruent with the collaborative nature of cyberspace and can be used to assess the learners' potential for future development in SCMC. However, research devoted to assessment in this area is quite rare (Darhower, 2002, 2007; Heather, 2003; Oskoz, 2003, 2005) and limited in scope.

Inextricably linked to Vygotsky's theory of the mediated mind and his notion of the zone of proximal development (ZPD) which is the difference between a person's actual and potential ability, DA offers mediation to help learners perform beyond their level of independent functioning through collaborative dialogue. In this way, it explores the learners' ongoing developmental processes and provides insight into their potentials for future development. Mediation in DA is offered in two general approaches: interventionist and interactionist, which include assistance provided in the form of standardized and unstandardized hints and prompts (Lantolf and Poehner, 2004). The interventionist approach includes mediation which is standardized and prespecified and administered during the test procedure. Interactionist DA includes interaction between the examiner and the examinee, in which the examinee is provided with unscripted help which is not preplanned, but rather emerging from the collaborative mediation to solve the examinee's problems. In Aljaafreh and Lantolf's (1994) conceptualization of mediation, the assistance provided by the mediator should be graduated, contingent, dialogic and tailored to the learners' ZPD.

This study aimed at exploiting the multimodal discourse of SCMC through a qualitative microgenetic analysis of the researcher's collaboration with L2 learners as they struggled to control different grammatical structures while working on their written narratives of picture stories and video clips in an SCMC context to obtain a richer understanding of the present and future learners' capabilities in SCMC. It also highlighted actual differences between the learners who were placed in the same CEFR levels of English structure in the online placement test of DIALANG.

As an adaptive diagnostic web-based assessment tool, DIALANG provides test-takers with scores related to the *Common European Framework of Reference for Languages* (CEFR). It provides feedback and advice on how to move towards the next CEFR level. Alderson and Huhta (2005) point out that one of the main innovative features of DIALANG is the breadth of its feedback. Although it is a step forward in the right direction in highlighting the learners' underlying problems, the main challenge leveled against the test, as Alderson (2005) puts it, is the lack of an adequate underlying theory of development in L2 learning and assessment. Ableeva (2010) asserts that this kind of developmental theory of learning that Alderson referred to was proposed by L.S. Vygotsky that constructed a diagnostic procedure of DA to dialectically unify instruction and assessment into a single activity.

The specific problem concerning the current study lies in the fact that in DIALANG the feedback given is not attuned to the learners' ZPD. The current study employed DIALANG structure section as a diagnostic tool to highlight the learners' grammatical

problems to be used as target structures in the interactionist DA in an SCMC context. Based on DIALANG's diagnostic feedback, modals and prepositions which proved problematic for both participants were selected as the targets of DA and transcendence (TR) sessions to explore the learners' microgenetic development. The microgenetic development primarily concerns the observation of skill acquisition through mediation over a relatively short span of time that enable researchers to examine specific instances of the development. The microgenetic method highlighted the differences in the non-dynamic DIALANG test and the interactionist DA and uncovered the learners' potentials for future learning and development.

## **2.Literature review – DA in SCMC**

The increasing popularity of the Internet in the recent years has resulted in unprecedented ways of communication with other people in geographically distant areas of the world. Web users make use of the affordances of SCMC to interact with one another in real time via video, audio and text. In SCMC, participants can have real-time interaction via chat rooms, instant messengers, or video conferencing. They can post typed messages, which appear on the computer screen and can scroll back and forth to review shared content.

The collaborative features of SCMC result in collaborative construction of knowledge that creates a new manifestation of Vygotsky's notions of scaffolding in ZPD (Beauvois, 1997). The multimodal discourse of SCMC affords learners collaborative dialogue through hypermedia. Hypermedia is the "computerized way of representing the semantic network in human memory through its nodes and links" (Liu & Reed, 1995, p.16). Slaberry (1996) asserts that hypermedia systems are assumed to foster higher order thinking skills and extend learners' zone of proximal development. Ozkoz (2005) argues that the visual saliency of the SCMC form enables learners to think, see, and edit their own production, thereby possibly increasing the opportunities for learners to notice their errors with minimal feedback from the outside and take subsequent responsibility for error correction.

There is a limited body of literature on dynamic assessment in SCMC within the sociocultural theory of mind (SCT) framework (Darhower, 2007; Birjandi & Ebadi, 2012; Ebadi, 2014; Oskoz, 2005; Salaberry, 2000; Shrestha & Coffin, 2012). Shrestha and Coffin (2012) investigated the effect of DA on academic writing via email in the form of text-based mediation. They conclude that DA can serve as an effective tool for supporting learners with their academic writing. One of the drawbacks of their study is the fact that transcendence tasks were not included to ensure the control of tasks not only in DA but also in more complex and difficult tasks in transcendence. Oskoz (2005) investigated how learners scaffold

each other in L2 Spanish chat sessions using Aljafreeh and Lantolf's (1994) pioneering regulatory scale. Oskoz (2005) argues that a shift in pedagogy from an individual product-based learning to cooperative process orientation demands new evaluation tools and a new research agenda. DA, focusing on the process rather than on the product, presents itself as an alternative approach with which to assess students' performance in SCMC (p.517). In her inquiry into peer-to-peer mediation in online DA, Oskoz reaches the general conclusion that "(...) it is possible to observe students' potential level of development in online chat" (p. 528). One of the drawbacks of her study is lack of systematic investigation of specific morphosyntactic structures (Darhower, 2007). It also failed to generate the typologies of mediation and reciprocity moves for DA in the SCMC context.

Focusing on the effects of text-based online chat on L2 development, Salaberry (2000) compared the language of four Spanish learners in an offline setting versus an online setting. Salaberry claims that SCMC is more effective for the development of Spanish morphosyntax. He found that the process of scaffolding and morphosyntactic development was more evident in the online setting. Salaberry showed greater evidence of morphosyntactic development for past tense verbal endings in L2 Spanish in SCMC dialogues than in face-to-face dialogues. He concludes that SCMC discourse may represent a pedagogically sound environment for L2 development.

In the previous studies on L2 DA in SCMC, mediation was one of the basic principles of Feurestian et al. (2002). The mediated learning experience (MLE) and a cornerstone of DA was carried out only in spoken form. The present study combines both written and spoken forms for mediation using the advantages of multimodal discourse of the collaborative Web and SCMC features to uncover learners' future potentials for development.

### **3. Study**

Following most SCT researchers who advise basing the assessment of ZPD on qualitative evaluation in order to shed more light on learners' development (e.g. Lantolf & Thorne, 2006; Summers, 2008; Ableeva, 2010), this study gives priority to a qualitative approach which is best suited to the ZPD concept and captures the process-oriented nature of SCMC. Most of previous studies implemented microgenesis as the general analytical framework with which to investigate the level of self-regulation in learners' cognitive development. The microgenetic method primarily concerns the reorganization and development of mediation over a relatively short span of time (Lantolf, 2000, p.3). Mitchell and Myles (1998) describe microgenesis as "(...) a local, contextualized learning process that can sometimes be traced visibly in the course

of talk between expert and novice.” (p.198). Microgenesis provides the opportunity to gain a richer understanding of the mediation to co-construct meaning and learning potential. Moreover, it is highly compatible with collaborative Web technology and process-based SCMC that offer tracking systems to digitally record learners’ microgenetic cognitive development.

### **3.1. Participants**

The participants of the study were two volunteer Iranian University students whose native language was Persian. They were required to take part in the structure section of the DIALANG test to investigate their English grammar ability level and obtain a diagnostic feedback of their grammatical problems. The DIALANG results revealed that both were at CEFR’s A2 level and had problems in the use of English modals and prepositions. To ensure confidentiality and protect the participants’ identity pseudonyms were used in this study. One of the participants, Dena, was working on his PhD dissertation in cognitive psychology in France. He had lived in France for three years and had lost contact with English for a relatively long period of time. He was worried that he might forget his knowledge of English. Although he studied in French, he thought that learning English was absolutely necessary for his future career. He was a regular Internet user for checking e-mail and working on his projects and was particularly interested to use Internet tools for conducting interviews for his dissertation. He had no previous experience of using the Internet for language learning. The other participant, Sarah, was attending an English language college to improve her command of English in London. She was a Ph.D. candidate in educational psychology at a university in Tehran and thought this study might help her improve her English structure and writing. She only used the Internet for checking mail and had a difficult time working with *Skype* and *Google Wave*.

### **3.2. The context of the study**

Due to the fact that the participants of the study were geographically distant, the use of some form of SCMC, an indispensable part of the research, could allow the participants to communicate and exchange information in real time. *Skype*, a free online phone service, was used to provide the learners with oral mediation and prompts in DA and transcendence sessions offering live interactions via text, audio and video. To track and archive the participants’ written narratives and follow the mediation process online, the researcher used *Google Wave* (GW now replaced with *TitanPad* and *PrimaryPad*) mainly for ease of use and allowing students to enjoy a wide array of collaborative tools such as highlighting and shared web links in real time. By integrating *Skype*’s audio application with *GW*’s live platform for written

narrative, the researcher could combine oral and written prompts in online mediation, which has been unprecedented in both traditional classroom-bound and other SCMC DA studies. To document the data collection procedure and post-study semi-structured interviews, the *Skype* mp3 call recorder and *CamStudio 2.0* were downloaded and employed for audio recording of oral narrations and interviews along with the screen casts of the written narratives on GW.

### **3.3. Instrumentation**

The data instruments that drove this study included a Web-based diagnostic test of DIALANG, transcripts of the learners' oral and written narratives, transcripts from the interactionist DA and transfer sessions in SCMC.

#### **3.3.1. DIALANG**

To assess L2 learners' grammatical competence in an online computerized testing system, DIALANG's structure section is considered as one of the most popular tools which can be used to report learners' level of grammatical ability. As an adaptive diagnostic web-based assessment tool, DIALANG which is free and available at <http://www.lancs.ac.uk/researchenterprise/DIALANG/about> provides test-takers with scores related to the Common European Framework of Reference for Languages (CEFR). It provides feedback and advice on how to move towards the next CEFR level. As a non-dynamic test, DIALANG does not provide feedback attuned to the learners' ZPD. This study employed the structure section of DIALANG as a diagnostic tool to highlight the learners' grammatical problems to be used as target structures in the interactionist DA in an SCMC context. The DIALANG results revealed that both participants had problems in the use of English modals and prepositions which were used as the target structures in DA and TR sessions. The study also aimed at pinpointing the differences in non-dynamic DIALANG test results presented in CEFR levels and interactionist DA to uncover the learners' potentials for future learning and development.

#### **3.3.2. Language-Related Episodes (LREs)**

According to Darhower (2002), data reduction is necessary to maintain consistent and systematic data analysis. Reduction is achieved by selection of relevant episodes. Nassaji and Swain (2000) defined a relevant episode as a language unit containing an error in a target structure and corresponding feedback. 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). Research has shown that LREs as mini dialogues in which learners ask or talk about language, or explicitly/implicitly question their own language use or that of others represent language learning in progress and are, therefore, the site of language learning (Swain & Lapkin, 1998). LREs contain linguistic problems that provide a record of the observation of moment-by-moment mediation within the ZPD. In the present study, particularly interesting instances in which learners struggled with some target structures during DA sessions and transfer tasks in LREs are the unit of analysis. The researcher looked for some signs of development in the use of the target forms in each 60-minute SCMC-based interactionist DA session to determine the learners’ potentials and their capacity to self-regulate their performance while engaging in DA sessions and more challenging transfer tasks.

### 3.4. Data collection procedure

Aljaafreh and Lantolf (1994) point out that correcting learners’ grammatical errors in a production mode provides an optimal situation for interaction between the learner and the expert, which is termed ‘mediation in interactionist DA’. To uncover the learners’ ZPD levels, they were engaged directly in producing the target structures in written narratives of different picture stories and video clips via SCMC because it was believed that the grammatical significance of these features might be realized more in production than in comprehension (Nassaji & Swain, 2000).

Different materials were used for data collection at each stage of the study. For non-dynamic assessment (NDA) and diagnostic phase of the study a lion picture story was shared via *Skype*'s screen sharing application with the participants to be narrated orally and in written forms in *Skype* and *GW* respectively. For DA sessions, a silent *YouTube* video clip named *The Pear Story*, comprising five scenes, was used. To evaluate the learners’ level of internalization and ability to extend DA mediation to new and more challenging contexts transcendence (TR) was employed.

This study intended to investigate near and delayed TRs with one- and two-week intervals between the sessions. For TR1, a picture story depicting a heroine rescue of a dog drowning in a river by a passer-by who risked his life to save the dog was shown to the learners. This TR task was presumably more challenging because of its dramatic rescue scenes, which involved emotional reactions on part of the learners. The second task in TR2 was of a rather different nature. It comprised a short clip from *Mr. Bean*, a popular British comedy, in which the hero engaged in a series of wrong doings in the open day in a school. The clip

selected seemed to be more challenging because it covered different themes and included more characters.

Following Poehner's (2005), this study employed the cake format, i.e. the researcher and the learners went through the text sentence by sentence and mediation was provided when learners faced problems in a dialogic and highly flexible manner both in Persian and English. During the online collaborative mediation, L1 was used to reduce the learners' cognitive load and to keep the flow of mediation. As the researcher could keep track of the learners' moves to incorporate the target structure into their writings via the affordances of *GW*, the mediation offered at the enrichment was contingent and tailored to their ZPDs for the target structures.

The learners' performance was evaluated in the following assessment sessions: First, they took part in a non-dynamic (NDA) session as the baseline and pretest which was repeated for all participants after DA sessions to find out about the underlying problems and the level of progression towards self-regulated behavior of the target structures. In DA1 and DA2, the learners and the mediator worked dialogically in the enrichment program to promote their cognitive functioning of the target structures. DA2 was followed by a near transcendence session, which was carried out within a week interval to capture the learners' ability to extend the outcome of the mediation within a short time period. It was followed by a delayed TR2 conducted within a two-week interval to ensure the long-term effect of internalization of mediation and to determine whether self-regulation has been short-lived or not.

### **3.5. Tracking learners' microgenetic development in ZPD**

The evaluation of the learners' microgenetic development was based on the transcripts of the audio and video recordings of all data collected through the study. The microgenetic analysis of the learners' development was presented through language-related episodes (LREs) taken from mediation carried out between the mediator and the learners in different sessions. The LREs represented the mediator and learner's interactions in an SCMC context to solve any possible problems with target structures. In the individualized enrichment program in DA sessions, the mediator embarked on the mediation process with the most indirect way of providing assistance to the learners. This is what Aljaafreh and Lantolf (1994) called "collaborative frame", i.e. the experts' mere online dialogic presence that triggers correction on the part of learners. They further pointed out that the collaborative frame represents the minimal level of contingent help available to the learners in ZPD. Because of visual saliency of an SCMC context, the virtual collaborative frame assumed a more prominent role for mediation in the present study. This study also used symbolic mediators, i.e. highlighting and web links that literally assumed a



greater role than the direct mediation between the mediator and the learners. The web links offered as a mediation move provided the learners with different written descriptions and examples of target structures and contributed to their conceptual learning of them. Some of the participants who were struggling with the target structures were required to find some relevant web links before the sessions so that they could use them while writing their narratives. Highlighting of the erroneous sentences as a form of implicit mediation raised the learners' awareness to locate the source of error and provided the opportunity for self-regulation (see table 1).

To evaluate mediation within ZPD, Aljaafreh and Lantolf (1994) developed five transitional levels of mediation strategies to track learners' microgenetic development from other-regulated to self-regulated performance within DA sessions and transfer tasks (see figure 1). Following Aljaafreh and Lantolf's (1994) study, the criterion to represent microgenetic development in the present study was determined by the quality and frequency of the help provided through mediation as the learners moved through ZPD in five transition levels (see figure 1) towards control over the target structures.

**Figure 1.** Levels of internalization from interpsychological to intrapsychological functioning (Ohta, 2000).

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Level 1

The learner is unable to notice or correct the error, even with intervention.

Level 2

The learner is able to notice the error, but cannot correct it, even with intervention, requiring explicit help.

Level 3

The learner is able to notice and correct the error, but only with assistance. The learner understands the assistance and is able to incorporate the feedback offered.

Level 4

The learner notices and corrects an error with minimal or no obvious feedback and begins to assume full responsibility for error correction. However, the structure is not yet fully internalized since the learner often produces the target form incorrectly. The learner may even reject feedback when unsolicited.

Level 5

The learner becomes more consistent in using the target structure correctly in all contexts. The learner is fully able to notice and correct his/her own errors without intervention.

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In the individualized enrichment program in DA sessions, the mediator provided the learners with different mediation moves from the most implicit to the most explicit ones to

evaluate their level of responsiveness and progress towards the self-regulation of target structures. The mediation at this stage resulted in the emergence of mediation and reciprocity typologies out of thematic analysis of data as the criteria to evaluate the learners' microgenetic development of the target structures. Poehner (2005) believes that developing typologies is essential for uncovering microgenetic development over time in DA studies. Through mediation and reciprocity typologies one would track the precise level of mediation that a learner required and how this might change with time. The mediation typology used (see Table 1) included four general categories, namely awareness raising, problem identification, overcoming the problem and finally, focusing on the structure. The typology contained different mediation moves employed by the mediator in an individualized manner based on the learners' level of ZPD for the target structures and their reciprocity to mediation in SCMC-based DA.

**Table 1.** Mediation typology

	Themes	Description		Categories
M1	Awareness-raising	The learners are prompted to use Web 2.0 affordances to become aware of their errors	M1.1.	Virtual collaborative frame: Using visual saliency of SCMC to detect errors
			M1.2.	Auto smart edit, taking advantage of <i>Google Wave's</i> edit application to offer choices by automatically underlining grammar and spelling errors
M2	Problem identification	The learners are prompted to identify the erroneous sections within a sentence.	M2.1.	Yellow highlighting of the sentence containing error/errors
			M2.2.	Zeroing in on the exact location of error using red highlighting
M3	Overcoming the problem	Cyber-mediation is used to provide the target structures and share the inserted relevant web links	M3.1.	Incorporating the link content and solving the problem
			M3.2.	Failing to use the information in the links to solve the problem
			M3.2.	Highlighting the examples and illustrations in the web page

M4	Choice offering	Learners are offered choice to find out about their level of understanding of the target structures.		
M5	Focusing on the target structures	Learners are explicitly mediated orally to fully explore the target structures.	M5.1	Providing the correct form orally
			M5.2	Explaining orally and exemplifying the target structure
M6	Justification of response	Learners are asked to talk about the reasoning behind the choice of target structures.	.	

Similarly to the mediation typology, the reciprocity inventory (Table 2) emerged out of thematic data analysis. This typology falls into four main categories organized hierarchically from learners' lack of reciprocity to virtual collaborative frame and highlighting mediation to their taking on responsibility for performance by explaining and exemplifying the target structures.

The reciprocity inventory was divided into two general themes as indicators of low and high reciprocity to mediation. Contrary to the mediation typology, this inventory started with the learners' low reciprocity in the form of lack of response or partial reciprocity to mediation. The learner who exhibited this type of behavior was considered low in their ZPDs for the target structures. On the other hand, the main themes of overcoming the problems and assuming full responsibility for mediation (see Table 2) represented high reciprocity levels and progression towards self-regulation. The lack of reciprocity to mediation occurred at different stages ranging from VCF as the most implicit mediation move to oral explanation of the target structure that represented the most explicit type of assistance provided by the mediator.

**Table 2.**The Reciprocity Inventory

	Themes	Description	Categories
R1	Lack of responsiveness to mediation	Failure to identify the location of error in VCF and highlighting	
R2	Partial responsiveness to mediation	Problems in error identification and incomplete incorporation of mediation	R2.1. correcting some errors, missing the others
			R.2.2. Changing correct structures into incorrect ones

			R2.3. Overgeneralization of previous mediation
			R2.4. Backsliding and Regression
			R2.5. Responding incorrectly
R3	Overcoming the problem	Using the mediator as a resource and incorporating his mediation to solve the problem	R3.1. Asking for more help
			R3.2. Solving problems
R4	Assuming full responsibility	Trying to consolidate the mediated structure by offering explanation and exemplification	

#### 4. Results and discussion

This section aimed at reporting each learner's individualized mediation needs and reciprocity levels, which represented the procedure through which the learners' internalization and progression towards self-regulation in the Zone of Proximal Development for the target structures was determined and later evaluated and analyzed in the following results section. It also highlighted real differences between the learners who were placed in the same CEFR levels of English structure in the online placement test of DIALANG. This microgenetic analysis also pinpointed the unpredictable and chaotic nature of development manifested in mediation in online DA, which was marked by constant backsliding and regression.

After presenting some LREs in which each learner's microgenetic development for the target structures within and across sessions was explored, the level of internalization and progress towards self-regulation based on Aljaafreh and Lantolf's (1994) criteria for progression in the ZPD (see Figure 1) and the typologies of mediation and reciprocity (tables 1 and 2) was evaluated.

The first language related episode (LRE) was taken from an interaction between the mediator (M) and Dena (D) as they worked together to evaluate and revise a sample of Dena's written narrative of the pear story in DA1. In the following excerpt, he produced the sentence "The farmer cant's understood."\* and the mediator offered assistance as the learner attempted to overcome the modal+tense problem in the following online mediation in SCMC. In sentence 120, Dena used L1 for translation to exercise control over his narrative, but he failed to correct the error in sentence 4. Because of the learner's problems in incorporating the assistance provided, the mediator applied more explicit forms of mediation, namely highlighting in red and inserting web links in sentences 5 and 7 respectively. While the red

highlighting located the error site within the sentence, the provided web links made relevant websites with the information on the target structure available to be used by the learners. This new form of *cyber-mediation* allowed the learners to explore not only the provided web sites but more embedded relevant links to expand their understanding of the target structures. Interestingly, the learner managed to correct his own error after being mediated by the web link in sentence 8. At this stage, the mediator wanted to make sure about the reasons behind the correction so the learner was asked to justify his correction. He used examples of correct and incorrect forms of modals in the website to do the correction. At this point the researcher found out that the learner used the Web as a resource to mediate himself and managed to solve the problem.

1. D: *The farmer cants understood.\**
2. M: *The farmer cants understood.*
3. D: *Using LI for translation (Mikhastam begam ke on keshavarzeh nafahmid)*  
*(I wanted to say that the farmer did not understand)*
4. D: *The farmer can not understood.*
5. M: *The farmer can not understood*
6. D: *The farmer could not understood.*
7. M: *Follow this link: [http://www.eslgold.net/grammar/basic\\_modals.html](http://www.eslgold.net/grammar/basic_modals.html)*
8. D: *Understand?*
9. M: *Why?*
10. D: *Because we have this example in the webpage: "Jack could hear the Bell" which is correct. We should use the simple form of verb.*
11. D: *So, he couldn't understand*
12. M: *very good, excellent!*

This episode represented mediation between the mediator and Dena on modals, in which the former had to provide the latter with different types of implicit and explicit help ranging from the most implicit level of assistance (VCF) to the level which indicated the incorporation of the content of the provided web links and solving the problem. The data in this excerpt revealed that the learner was unresponsive to mediation on this structure that reflected the lowest reciprocity level which was characterized by learner's failure to identify the location of error in VCF and highlighting. Despite being able to notice the error, he could only correct it with explicit help. Consequently, Dena was placed in level 2 of internalization of assistance in Aljaafreh and Lantolf's formulation of criteria for internalization of progression towards ZPD (see Figure 1). His repeated failure to grasp the target structure

through mediation gave the mediator a better understanding of her potential level of development because, as Vygotsky (1978) points out, we often learn more about how a cognitive system operates when it is observed under conditions of failure and breakdown than when we observe the system functioning smoothly.

Three weeks later in TR2, Dena experienced problems with the use of modals in the following LRE. Once again, the mediator attempted to help the learner overcome the difficulty. This time, however, the learner reacted positively to less explicit assistance, and he was partially responsive to mediation. It appears later that the learner's level of understanding had changed between DA1 and TR2 sessions. In both cases, he was unable to control the structures independently and asked the researcher to help. However, the frequency and type of help offered changed. In sentence 13, although responding partially to mediation, Dena only corrected one of the errors in the sentence and missed the other which was the target of mediation. After the mediator zoomed in on the location of error by red highlighting, he managed to correct the error. As is clear in this episode, Dena solved the problem using less explicit help than during the previous sessions. In other words, he basically showed signs of development in her ZPD in TR2 session by responding to less explicit help. The learner clearly moved up in her ZPD to level 3 of internalization of assistance in which he was able to notice and correct the error, but only with assistance from the mediator.

13. D: *Mr. Bean should starting looking for man*

14. M: *Mr. Bean should starting looking for man*

15. D: *Mr. Bean should starting to look for man*

16. M: *Mr. Bean should starting to look for man*

17. D: *Oh, start, sorry!*

As illustrated in the following LRE, in the same session, Dena faced the same problem with the use of modals once again, which he managed to correct only after being mediated by yellow highlighting. His responsiveness to mediation increased and ascended to overcoming the problem category in the reciprocity typology. He also noticed and corrected the error with minimal or no obvious feedback and began to assume full responsibility for error correction. He possibly moved to level 4 of internalization of target structure.

18. D: *Mr. Bean he could not recognition him.*

19. M: *Mr. Bean he could not recognition him.*

20. D: *Mr. Bean could not recognize him.*

The above excerpts demonstrated microgenetic development of the learner for this target structure. Unlike DA, in psychometric-based NDA, only the learner's independent

performance based on the zone of actual development (ZAD) would have been looked at, and this development would probably not have been visible.

The following LRE illustrated an exchange between the mediator and Sarah in DA1, in which she had the same problem with modals as experienced by Dena in the previous exchanges. In sentence 23, she focused on the past tense and changed 'may' into 'might' but failed to notice a more serious error. After being mediated by red highlighting, she could notice the erroneous section and correct the error. In sentence 27, she gave reasoning for her correction in L1 to convince the mediator that she already knew something about modals in English. As it was evident in the following interaction, Sarah was more responsive to mediation for modals than Dena. Aljaafreh and Lantolf (1994) argue that a learner who is able to produce a particular structure in response to less explicit forms of mediation is developmentally more advanced than one who needs more explicit and direct feedback for the same structure. The data prove that Sarah could take responsibility for her performance with less explicit help in her first encounter with this problem in DA1. She was able to notice and incorporate the assistance, which characterizes level 3 of internalization of assistance in ZPD.

21. S: *he said he may finds better condition.*

22. M: *he said he may finds better condition.*

23. S: *he said he might finds better condition.*

24. M: *he said he might finds better condition.*

25. S: *he said he might find better condition.*

26. M: *why?*

27. S: *(fek mikonam bad az inha, can,may,might fel bedon s miad)*

*(I think after modals we should not use"s")*

28. M: *OK*

Two weeks later in TR1, the mediator traced an error in Sarah's writing on the same modal problem. As soon as he highlighted the sentence in yellow, Sarah corrected the error instantly. As a matter of fact, what she needed for self-regulation was only a second chance with much less explicit assistance. The data highlighted the fact that Sarah actually moved up to level 4 of internalization of assistance in which she noticed and corrected the error with minimal or no obvious feedback assistance.

29. S: *the dog might to be hungry.*

30. M: *the dog might to be hungry.*

31. S: *the dog might be hungry.*

However, the structure was not yet fully internalized at this stage since the learner sometimes produced the target form incorrectly as in the following LRE in TR2.

32. S: *they may be continue life happily.*

33. M: *they may be continue life happily.*

34. S: *they may continue life happily.*

## 5. Conclusion

The LREs presented in this section indicated that although both Sarah and Dena were at the CEFR's A2 level for English structure and both could not produce modals correctly before mediation, their reciprocity levels and required mediation revealed important information about actual differences in their ZPDs for modals realized in dialogic interaction. This highlighted the inadequacy of proficiency levels reported in the psychometric-based DIALANG results in pinpointing learners' future potentials for L2 grammar development.

The findings of the study highlighted the point that conducting assessment non-dynamically provided only very limited information about learners' independent performance in their ZPD. DA mediation and reciprocity patterns gave a more accurate picture of the learners' potential for future functioning. Because of the individualized nature of the interactions in ZPD, the researcher did not intend to generalize the findings of the study to new contexts. Instead, attempts were made for a thick and rich description of the technical aspects of the SCMC context, detailed explications of the mediation and reciprocity moves between the mediator and the learners to make the reader experience the events as they unfolded in the study.

A potential limitation of this study is 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. 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. As the present study examined only the A2 level, exploring the differential effects of DA across CEFR levels i.e., on the A1 and A2 levels with B1 and B2 levels, could be an interesting subject of further research.

Because of the fact that the present study focused exclusively on the development of linguistic competence of L2 learners, further research on the effects of discursal moves, pragmatic and cultural dimensions of communicative activity might shed new light on the nature of mediation in SCMC-based DA.



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