



Investigating the Co-construction of Collaborative Dialogue in Synchronous Computer-Mediated Communication

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Abstract

Despite the growing interest in examining the link between peer-peer collaborative dialogue and second language development in recent years, much of the empirical work in this regard focused on face-to-face communication, leaving its operationalization in text-based synchronous computer-mediated communication (SCMC) largely unexplored. This study explores how episodes of collaborative dialogue around English idioms are carried out during SCMC-based dyadic interaction and their effectiveness in promoting vocabulary learning. Sixteen English learners accomplished two types of idiom learning tasks through SCMC-based collaboration and responded to a pretest, posttests, stimulated recall interviews, and reflective journals. Within a case study design, this study drew on chat transcripts, stimulated recall comments, reflective journal entries, pre and posttest scores for data analyses. The results suggested that in working together on the English idiom learning tasks, the dyads engaged in the four patterns of interaction that had emerged in face-to-face communication (Storch, 2002), notably collaborative, expert/novice, dominant/dominant, and dominant/passive. Moreover, the patterns seemed to be influenced by the nature of the tasks and the increase in the dyad members' knowledge of the meanings of the target idioms. In addition, all dyads developed their knowledge about the meanings through their multiple encounters with the target idioms. Overall, the co-construction of collaborative dialogue in SCMC seemed to play an important role in English learners' vocabulary learning and cognitive development.

Keywords: collaborative dialogue, patterns of interaction, English idiom learning, SCMC, sociocultural SLA

INTRODUCTION

As a relatively new construct, "collaborative dialogue" has over the decade drawn considerable attention in second language acquisition (SLA) research informed by Vygotskian sociocultural theory of mind (Vygotsky, 1978, 1987). SLA studies based on sociocultural theory of mind, notably sociocultural SLA (Lantolf, 2000b), emphasize the importance of interaction to second language (L2) development. It posits that "Individuals obviously do play a role in learning, but what they will eventually be able to do by themselves, they first achieve collaboratively during social interaction" (Ellis & Barkhuizen, 2005, p. 229). With respect to the interaction between L2 learners,

sociocultural SLA researchers were mostly concerned with the effects of collaborative dialogue, the kind of dialogue “in which speakers are engaged in problem solving and knowledge building” (Swain, 2000, p. 102), on L2 learning. It has been theorized that collaborative dialogue mediates SLA as it enables learners to consciously reflect on their L2 use while expressing their intended meaning (Swain, 1998, 2000) and facilitates individuals’ internalization of co-constructed L2 knowledge (Lantolf, 2001, 2006). These claimed benefits of collaborative dialogue to L2 learning have gained substantial empirical support in the literature (see, for example, Swain, Brooks, & Tocalli-Beller 2002).

Despite these research endeavors, studies on collaborative dialogue seem to be largely restricted to face-to-face communication, whereas its operationalization in the electronic medium, especially in text-based synchronous computer-mediated communication (hereafter referred to as SCMC, also known as text-based online chat), has been ignored. SCMC allows for real-time discussion among communicators at a physical distance and therefore can offer unique opportunities for learner collaboration. Since SCMC has features that strongly resemble oral and written communication, it may be beneficial for learners to improve their L2 abilities through SCMC-based interaction with peers and instructors (Smith, 2003). In addition, SCMC has been purported to increase the quantity and quality of L2 production, ensure more equal participation, reduce communication anxiety, and improve students’ attitudes and motivation toward L2 learning (Beauvois, 1992; Böhlke, 2003; Kelm, 1992, Kern, 1995; Satar & Ozdener, 2008; Warschauer, 1996). In a word, SCMC serves as “a potentially useful tool for collaborative language learning” (Warschauer, 1997, p. 477), and the investigation of the operationalization of collaborative dialogue in a SCMC environment seems appealing.

It is also important to point out the lack of concern for the development of vocabulary knowledge through collaborative dialogue. Existing studies focused heavily on learners’ writing performance (e.g., Elola & Oskoz, 2010; Lee, 2008; Liang, 2010; Storch, 2011; Sun & Chang, 2012), and less research has been done on how it could aid L2 vocabulary acquisition, despite the fact that discussions around unfamiliar words were found to be more prevalent than other linguistic structures during collaborative interaction (e.g., Leeser, 2004; Williams, 1999, 2001).

The current study seeks to address the aforementioned problems through the examination of the effects of SCMC-based collaborative dialogue on the development of L2 lexical knowledge. It employs English idioms, a kind of linguistic structure that does not normally occur in English learners’ oral and written production, as the specific learning targets. Specifically, it investigates how collaborative dialogue is carried out in SCMC and its association with English learners’ comprehension and retention of the meaning of the target idioms. The research questions addressed in this study are:

1. What patterns of interaction do the dyads engage in when deciphering the meaning of the target English idioms within SCMC-based collaborative dialogue?
2. Are SCMC-based collaborative dialogue effective for promoting English idiom learning?

LITERATURE REVIEW

Definition of collaborative dialogue

A basic tenet of Vygotskian sociocultural theory of mind is that all learning stems from mediation, “the process through which humans deploy culturally constructed artifacts, concepts, and activities to regulate (i.e., gain voluntary control of and transform) the material world or their own and each other’s social and mental activity” (Lantolf & Thorne, 2006, p. 79). Language, as an essential form of symbolic artifact, mediates thinking and contributes to learning accordingly. To better link mediation and SLA, the Canadian scholar Merrill Swain put forward the idea that speaking and writing are not simply the message conveyed by learners but are cognitive activities; specifically, they “shape and reshape cognition” (Swain, 2006, p. 96). She argued that learners’ output can be viewed as a hybrid of “saying”, the process of formulating utterances and externalizing cognition, and “what was said”, the utterances that have been articulated, which are also the product of “saying” that can be further analyzed and modified through the use of language. Although both “saying” and “what was said” require cognitive efforts, Swain claimed that reflections on what was said may be more significant to learners since it is where “languaging” comes into play: in order to make sense of their output, learners need to make use of their linguistic repertoire to grapple with the miscomprehension in their utterances and expand their L2 knowledge to compensate for the holes they notice in their interlanguage. The resolved language problems and newly constructed L2 knowledge would later be internalized in learners’ minds and contribute to the development of their interlanguage. To Swain, languaging reflects “the process of making meaning and shaping knowledge and experience through language” (Swain, 2006, p. 98) and is where the mediation of output resides. More importantly, languaging about language is the source for SLA; “In it, we can observe learners operating on linguistic data and coming to an understanding of previously less well understood material. In languaging, we see learning taking place” (ibid).

Although sociocultural SLA researchers contended that languaging could be achieved through individual efforts in the form of private speech (Lantolf, 2001), it was true that individual learners, especially those at a relatively low proficiency level, might be deficient in talking about the language they produced (Leeser, 2004). It was also possible that individuals might come to incorrect solutions to the language problems they encountered (Kim, 2008). In this regard, Swain and Lapkin (2002), underscoring the social aspect of learning that is vital to Vygotskian sociocultural theory of mind, maintained that output mediated SLA best through collaboration, that is, through collaborative dialogue. According to them,

In order to collaborate, learners must speak to each other. Through their dialogue, they engage in making meaning, and debate the meaning made. To make their meaning as clear, coherent and precise as possible, learners will debate language form (morphosyntax through to discourse and pragmatics) and lexical choice. This talk about language (metatalk) mediates second language learning (p. 286).

This emphasis on the mediation of collaborative dialogue in the process of L2 learning seemed to be corroborated by Ellis (2003), who made the claim that “Verbal interaction can be monologic or dialogic. Whereas both can serve to mediate learning, dialogic interaction is seen as central” (p. 177).

Collaborative dialogue and L2 development

In SLA research, collaborative dialogue was often examined in relation to language-related-episodes (LREs), which Swain (2001b) described as “an instance of collaborative dialogue” (p. 286) and more specifically “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” (ibid). Leeson (2004) elaborated on the nature of LREs by specifying what they entailed, “(a) question the meaning of a linguistic item; (b) question the correctness of the spelling/pronunciation of a word; (c) question the correctness of a grammatical form; or (d) implicitly or explicitly correct their own or another’s usage of a word, form or structure” (p. 56). Among these many types of LREs, explicit discussions of word meaning or vocabulary-focused LREs and grammar issues or form-focused LREs seemed to be the major categories of LREs. For example, Swain and Lapkin’s (2002) investigation of the talk of a pair of French immersion students collaborating on a jigsaw task suggested that vocabulary-focused and form-focused LREs accounted for eighty percent of the overall LREs they produced. Malmqvist (2005) likewise found that the LREs generated by Swedish learners of German in completing dictogloss tasks were mainly related to vocabulary (58%) and grammar (42%). Findings of similar studies (e.g., Kim and McDonough, 2008, 2011; Leeson, 2004; Loewen, 2003, 2004; Williams, 1999, 2001) confirmed the high prevalence of vocabulary-focused and form-focused LREs in collaborative dialogue, indicating learners’ concern for their lexical choices and grammatical accuracy during their dyadic interaction.

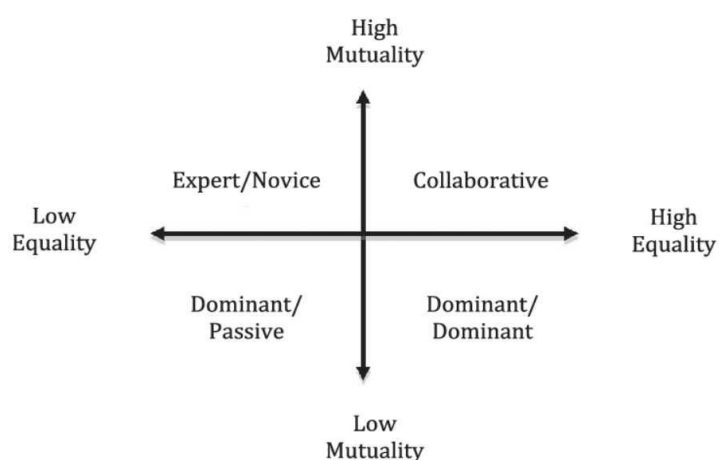
Since collaborative dialogue is viewed as the site in which L2 learning occurs and the basis for the internalization of co-constructed linguistic knowledge, in studies concerning LREs, tailor-made posttests appeared to be the most commonly adopted approach for the measurement of SLA. A glimpse of learners’ performance on the tailor-made posttests indicated their success in retaining the L2 features they had collaborated on. For example, Swain (1998) found that the correct solutions that learners reached in their LREs on forming feminine adjectives from masculine ones in French tended to be the accurate answers they provided to the tailor-made dyad-specific posttest questions. Williams (2001) subsequently revealed that learners achieved between 40% to 94% accuracy on the posttest items that were created based on their successfully resolved LREs. Other more recent studies (McDonough & Sunitham, 2009; Kim, 2008; Tocalli-Beller & Swain, 2007; Watanabe & Swain, 2007; Zeng & Takatsuka, 2009) in a similar vein suggested that learners were able to convert the L2 lexical and grammatical knowledge they correctly co-constructed into their accurate performance on the tailor-made posttests. The strong link between correctly resolved LREs and the satisfactory scores that learners gained in the posttests to some extent indicated the positive impact that collaborative dialogue has on L2 development.

Factors influencing the occurrence of collaborative dialogue

A crucial factor that may have an impact on the occurrence of LREs are the patterns of interaction. Particularly Storch's (2002) longitudinal study suggested the existence of four distinct patterns of interaction: collaborative, dominant/dominant, dominant/passive, and expert/novice. The division of these four patterns, according to her, was rooted in the degree of equality and mutuality exhibited in the learner-learner interaction. Specifically, the collaborative orientations, notably the collaborative and expert/novice patterns of interaction, were the one that resulted in the occurrence of LREs and the success in task completion given the acceptable level of equality and mutuality involved. The non-collaborative orientations, including the dominant/passive and dominant/dominant patterns, on the other hand, were the types that might have a negative effect on the production of LREs because of the insufficient equality and mutuality they encompassed (see Figure 1). Storch also claimed that L2 learners engaging in the collaborative orientations were more successful in internalizing the LREs they produced.

Succeeding studies conducted by Watanabe and Swain (2007) and Kim and McDonough (2008) added to the understanding of patterns of interaction by demonstrating how the patterns differed when the same L2 learners worked with interlocutors at different proficiency levels. Watanabe and Swain's (2007) study in particular suggested that the patterns of interaction remained the same when an intermediate Japanese learner of English worked with a low proficiency interlocutor versus with a high proficiency interlocutor. However, they also found that intermediate learners who were involved in the non-collaborative orientations when paired with intermediate interlocutors tended to be collaborative when they worked with advanced interlocutors.

Figure 1. A Model of Dyadic Interaction (Storch, 2002, p. 128)



Intermediate learners' discussion with advanced interlocutors, and the consequent collaborative orientations, also yielded a slightly higher accuracy rate of the resolutions

to the LREs. In a nutshell, pair dynamics seemed to have discernable effects on the generation of LREs, or by extension the learning of L2 knowledge, and the patterns of interaction that the members of a dyad showed may or may not vary depending on the characteristics of their partners.

Collaborative dialogue in SCMC

As far as sociocultural SLA is concerned, Yilmaz (2007) and Zeng and Takatsuka (2009) appeared to be the first two researchers who explored the operationalization of collaborative dialogue in SCMC. Particularly Yilmaz, in his PhD dissertation, examined the occurrence and characteristics of SCMC-based collaborative dialogue produced by Turkish speaking English as a Foreign Language (EFL) learners collaborating on jigsaw and dictogloss tasks. His analysis of the chat transcripts suggested that LREs were less frequent in SCMC than in face-to-face communication, and the majority of the collaborative dialogue generated through text-based online chat was vocabulary-focused and correctly resolved. Zeng and Takatsuka (2009) further investigated the connection between SCMC-based collaborative dialogue and SLA. Their data on Chinese tertiary-level learners' collaboration on a series of communicative tasks via SCMC and their performance on the immediate and delayed tailor-made posttests indicated that the text-based exchanges fostered their mutual attention to each other's language use as well as their lexical and grammatical growth. They also noticed that the participants in their study acquired (87.1%) and retained (82.8%) most of the lexical items they had successfully resolved in their vocabulary-focused LREs.

METHODOLOGY

The Research Design

This study used a descriptive case study to examine how collaborative dialogue was carried out in a text-based SCMC environment. As Heigham and Croker (2009) described it, a descriptive case "aims to present a detailed, contextualized picture of a particular phenomenon" (p. 71). The current study did not seek to verify a causal relationship between collaborative dialogue episodes and L2 vocabulary learning or generalize the results, but rather attempted to give a thorough and clear account of how SLA stemmed from peer-peer interaction and how the co-constructed knowledge about the target English idioms was appropriated and internalized at an individual level within the context of English language teaching in China. The detailed description and in-depth analyses required for achieving this research objective justified the use of a descriptive case study.

The Participants

Sixteen graduate students enrolled in an advanced academic writing course in China agreed to participate in this study. Their English proficiency was high intermediate, as determined by their scores on the entrance examination. The students and instructor met in a computer lab once a week, and the students performed writing-related activities and tasks on the computer.

The Materials

The materials used in this study can be roughly divided into two categories: one is the pedagogical materials, which consist of the English idiom learning tasks, and the other is the data collection materials and instruments, including a pretest, posttests, reflective journals, and stimulated recall protocols. English idiom learning tasks were implemented to foster the growth of the participants' receptive and productive knowledge about the meaning of the target idioms. For the development of receptive knowledge, two idiom-in-context tasks, which were based on the sixteen target idioms, were created. Each task included eight excerpts drawn from the Corpus of Contemporary American English (COCA) (Davies, 2008) that illustrated the contexts in which these idioms were used. To accomplish the tasks, the participants needed to figure out the meanings of the target idioms together based on the lexical and semantic cues and also provide justifications. For the development of productive knowledge, two text reconstruction tasks were introduced to the participants. Each task consisted of eight new excerpts that were similar to the ones used in the idiom-in-context tasks in terms of length and level of difficulty, and had been modified to demonstrate the incorrect use of the target idioms. To complete the tasks, the participants needed to identify and correct the errors collaboratively through SCMC-based interaction.

As far as the data collection materials and instruments are concerned, the pretest consisted of forty idioms compiled from various sources, including Simpson and Mendis' (2003) list of useful idioms for English for Academic Purposes (EAP) curricula and their findings on the most frequent idioms in the Michigan Corpus of Academic Spoken English (MICASE), along with the idioms recommended by O'Keefee et al. (2007) as suitable for ESL teaching and learning. The reasons for confining the target idioms to highly frequent ones in academic discourse are their relevance to the participants' learning needs and the comparatively high level of difficulty they may pose for intermediate English learners. The test asked the participants to indicate their familiarity with the meaning of these forty idioms through their responses to the Vocabulary Knowledge Scale (hereafter referred to as VKS). Among the forty idioms, sixteen that all participants indicated that they had never seen before or had seen before but did not know what they meant (marking I or II on the VKS) were selected as the target idioms for instruction. The sixteen target idioms were structurally and semantically different from each other. For the reflective journal, after completing the tasks, each participant was instructed to write their reflections on the collaboration process. The writing prompts asked the participants to elaborate on their perceptions of the tasks and the use of SCMC-based interaction for the completion of the tasks.

The posttests consisted of immediate, short-term and long-term posttests. Both immediate and short-term posttests were intended to measure the participants' receptive and productive knowledge of the target idioms. For the assessment of receptive knowledge, the posttests employed matching questions in which the participants were asked to pair the target idioms with the corresponding definitions. The assessment of productive knowledge involved supplying the definitions of the target idioms. The

participants were not informed that they would take a posttest in advance. For the long-term delayed posttests, the participants were instructed to use the VKS to indicate their knowledge of the target idioms. In addition, stimulated recall protocols in this study were developed for the elicitation of information regarding 1) the participants' thoughts during their co-construction of collaborative dialogue, 2) their understanding of the meaning of the target idioms, and 3) clarification of fragmented sentences and spelling errors. Stimulated recall protocols reveal the participants' "perspective of their behavior during their interaction which may not be apparent from the recorded pair talk alone" (Watanabe & Swain, 2007, p. 127).

Data collection procedures

The actual data collection occurred during the regular class time and in total lasted for nine weeks. On the basis of the English idiom learning tasks, the data collection can be divided into three stages, namely pre-task, on-task, and post-task. In the pre-task stage, after all participants took the pretest, sixteen idioms were selected as the learning targets, and the COCA excerpts that contained these sixteen idioms were extracted for the creation of the idioms-in-context and text-reconstruction tasks. The on-task stage consisted of two cycles of data collection, and each cycle was comprised of: 1) an idioms-in-context task, 2) an immediate posttest, 3) a text-reconstruction task, 4) a short-term delayed posttest, 5) reflective journals, and 6) stimulated recalls. Each cycle of data collection was conducted during the regular scheduled writing class that was held in a computer lab. In each cycle, the participants were assigned to their individual chat rooms for their online interaction. During the idioms-in-context tasks, the idioms were presented one at a time, and the order of presentation was fixed across all dyads. As soon as all dyads finished their online discussion and submitted their answers, they were given the correct meanings through a PowerPoint presentation and took the ten-minute immediate posttest. They were also instructed to write a reflective journal that reported their experiences of and feelings about their dyadic interaction. The text-reconstruction tasks were administered one week after the idioms-in-context tasks and were followed by short-term delayed posttests and reflective journals. The stimulated recall interviews with the participants were conducted one to four days after the text-reconstruction tasks. Two weeks after the short-term delayed posttests all participants entered the post-task stage and took the long-term delayed posttests without any advance notice.

Data analysis

Chat transcripts produced by the eight dyads in the completion of the idiom-in-context and text-reconstruction tasks, the participants' answers to the posttest questions, their reflective journal entries, along with transcripts of stimulated recall interviews constituted the main source of data for this study. For the quantitative analysis, due to the small sample size, descriptive statistics, including means, standard deviations and percentages, were calculated to support quantitative analysis. For the qualitative analysis, following Darhower's (2002) suggestion of data reduction, episodes of collaborative dialogue revolving around the target idioms that demonstrated the dyads' problem solving and knowledge construction were sorted and analyzed. The stimulated recall interview transcripts were also investigated thematically and holistically first, and

relevant segments were then singled out to corroborate the interpretations of the chat transcript excerpts.

For the first research question regarding the patterns of interaction that the eight dyads exhibited during their SCMC-based collaboration, the participants' chat transcripts were closely examined using Storch's (2013) index of equality, "the level of contribution and control over the task" (p. 37), and mutuality, "the level of engagement with each other's contribution" (ibid). The patterns of interaction were classified as collaborative, dominant/dominant, dominant/passive, and expert/novice. Furthermore, Storch (2002b) found that the collaborative orientations were characterized by discourse features including requests, explanations, phatic utterances (such as "yeah", "mm") and repetitions that were not so salient in the non-collaborative pattern. Both the levels of equality and mutuality and the discourse features were taken into consideration. The participants' comments on their online exchanges during the stimulated recalls and their reflective journal entries were also deployed to complement the findings from the analysis of chat transcripts.

The second research was investigated at three different levels: immediate and short-term, long-term. As far as the immediate and short-term development was concerned, the evidence was obtained from the participants' scores of the matching questions on the immediate and short-term delayed posttests. The rating of the matching questions in these two posttests followed the dichotomous scoring; that is, if the idioms matched their definitions, the participants received one point, and if not, they gained zero point.

The total scores for both posttests were therefore eight. The long-term development was measured on the basis of the scores that the participants received on the VKS. Particularly self-reported idiom knowledge of categories I and II received points of 1 and 2 respectively. Category III and IV had two possibilities: If the participants provided the correct synonyms, translations, or explanations, they were rewarded three points; otherwise they received two points. For Category V, incorrect responses and correct synonyms, translations, and explanations were given the points of two and three respectively, and four points were assigned to sentences that are semantically appropriate but grammatically inaccurate. Only the sentences in which the use of the target idioms was grammatically and semantically correct were scored as five points.

RESULTS AND DISCUSSION

Analysis of the level of equality and mutuality, discourse features, stimulated recall comments, and reflective journal entries suggested the existence of both the collaborative and non-collaborative orientations. It is noteworthy that for the text-reconstruction tasks, the collaborative dyads (6 out of 8) greatly outnumbered the non-collaborative dyads (2 out of 8). By contrast, for the idiom-in-context tasks, half of the dyads demonstrated the collaborative orientations, and the other half was non-collaborative in nature. As shown in Table 1, during the completion of the idiom-in-context and text-reconstruction tasks, the dyads that adopted the collaborative orientations on average spent more time on the tasks, took more turns, and produced more words than those

demonstrating the non-collaborative orientations. It is also important to note that in general the eight dyads, collaborating on the same types of tasks (for example, idioms-in-context tasks 1 and 2), engaged in quite similar patterns, while the patterns they exhibited during the completion of different types of tasks (for example, idioms-in-context task 1 and text-reconstruction task 1) varied considerably. In particular, there appeared to be a tendency among the dyads to move away from the non-collaborative orientation as their target idiom knowledge developed.

Table 1. Patterns of interaction during the completion of the “Idioms-in-Context” tasks (N=8)

Patterns of interaction	No. of Dyads	Mean No. of Words (SD)	Mean No. of Turns (SD)	Mean Time Spent (in mins) (SD)
Collaborative Orientation	4	621.13 (114.11)	67 (12.90)	35.88 (4.52)
Non-Collaborative Orientation	4	586.63 (128.01)	53.75 (17.31)	28.87 (3.91)

Table 2. Patterns of interaction during the completion of the “Text-Reconstruction” tasks (N=8)

Patterns of Interaction	No. of Dyads	Mean No. of Words (SD)	Mean No. of Turns (SD)	Mean Time Spent (in mins) (SD)
Collaborative Orientation	6	623.5 (114.81)	57.33 (11.17)	30.5 (4.85)
Non-Collaborative Orientation	2	461.25 (44.21)	46.75 (9.11)	30.5 (7)

In addition to the overall orientations, it is important to examine the patterns of interaction in terms of the roles that the participants assumed during their online exchanges. Table 3 lists the characteristics of the four patterns of dyadic interaction, notably collaborative, expert/novice, dominant/dominant, and dominant/passive that the eight dyads engaged in when working together on the idioms-in-context and text-reconstruction tasks. From it, several findings are of particular interest. First, similar to Storch's (2002) findings of the patterns of interaction in face-to-face communication, during the SCMC-based interaction in the current study, collaborative, rather than expert/novice, was the dominant pattern in terms of the collaborative orientations. It is clear from Table 3 and Table 4 that of the 10 pairs adopting the collaborative orientations, 8 were collaborative and 2 were expert/novice pairs, and these two expert/novice dyads only emerged during the completion of the text-reconstruction tasks. Furthermore, the trend to move away from the non-collaborative orientation can also be observed: while

the dominant/dominant pattern was found in the idioms-in-context tasks, no instance of its occurrence was identified in the text-reconstruction tasks. Despite being one of the collaborative orientations, compared with the collaborative pattern, expert/novice is viewed as the “asymmetrical relationships” (Storch & Aldosari, 2013, p. 46. The same is true for dominant/passive, as compared with dominant/dominant).

Table 3. Number of dyads exhibiting different patterns of interaction per task (N=8)

	Idioms-in-Context	Text-Reconstruction
Collaborative	4 (Dyads 1, 2, 5, 8)	4 (Dyad 1, 4, 5, 8)
Dominant/Dominant	2 (Dyad 3, 6)	0
Dominant/Passive	2 (Dyad 4, 7)	2 (Dyads 3, 7)
Expert/Novice	0	2 (Dyads 2, 6)

From Table 3 it is clear that the number of expert/novice and dominant/passive dyads increased to a great extent during the completion of the text-reconstruction task. This tendency to the asymmetrical relationships may stem from the fact that while deciphering the meaning of the target idioms together, neither of the members of the dyads had prior knowledge about the definitions, and therefore it was very unlikely that one member would take complete control of the tasks because he or she was more knowledgeable than the other one. However, in accomplishing the text-reconstruction tasks, the dyad members' unequal levels of comprehending and retaining of the meaning of the target idioms due to their previous exposure make possible one member's higher degree of contribution to and control over the tasks. The greater tasks demands of text-reconstruction tasks (for example, in the completion of idiom-in-context tasks, the participants only needed to focus on one idiom at a time, whereas in collaborating on the text-reconstruction tasks, they were required to attend to eight idioms simultaneously) may also led to the emergence of the roles of experts who directed the discussions and novices that were less competent and thus were encouraged to participate in the collaborative interaction. This explanation for the variation in patterns of interaction across tasks can be supported by the stimulated recall comments from one of the members in dyad 2, as she put it,

The idioms-in-context tasks went smoothly. Neither of us knew anything about these idioms, so we could only rely on the contexts for our guesses. I had a lot to say since I am good at guessing the meanings of new words. I enjoyed the pace of our collaboration because I was able to fully concentrate on the idioms. However, I found the text-editing tasks quite challenging. I couldn't recall all of the idioms immediately. It took me a while to figure out the answer until I noticed that my partner had already sent me her ideas and waited for my reply. It was really frustrating because there were so many things to attend to.

For the second research question, Table 4 summarizes the descriptive statistics for the immediate and short-term (one week) delayed posttests, and from it, several observations can be made. First of all, it supports the assertion that discussions around the target idioms were facilitative of the participants' comprehension and retention of their definitions. As shown in Table 4, on average, the participants scored 5.38 (SD = 2.19)

or obtained 67.19% (SD = 27.34%) correct answers on immediate posttest I, and 5.06 (SD = 2.14) or 63.28% (SD = 26.80%) on immediate posttest II. Although there were decreases in accuracy rates on the short-term delayed posttests, where the average score out of 8 target idiom items was 4.88 correct answers (SD = 2.00) or 60.94% (SD = 24.95%) on short-term delayed posttest I and 4.38 (SD = 2.19) or 54.69% (SD = 27.34%) on short-term delayed posttest II, given the fact that the participants had no prior knowledge of or additional exposure during the one-week interval to the meaning of the target idioms, the results of the immediate and short-term delayed posttests suggested that collaborative dialogue episodes that were indicative of the participants' efforts to understand the metaphorical expressions and their connection to the context, consisted of target idiom learning.

Table 4. Means and standard deviations of immediate and short-term delayed posttest scores (N=16)

Participants	Immediate posttest I scores (Accuracy rates)	Immediate posttest II scores (Accuracy rates)	Short-term delayed posttest I scores (Accuracy rates)	Short-term delayed posttest II scores (Accuracy rates)
S1	8 (100%)	7 (87.5%)	8 (100%)	8 (100%)
S2	8 (100%)	7 (87.5%)	6 (75%)	6 (75%)
S3	3 (37.5%)	3 (37.5%)	3 (37.5%)	2 (25%)
S4	5 (62.5%)	4 (50%)	2 (25%)	5 (62.5%)
S5	7 (87.5%)	8 (100%)	6 (75%)	7 (87.5%)
S6	8 (100%)	7 (87.5%)	7 (87.5%)	5 (62.5%)
S7	2 (25%)	3 (37.5%)	3 (37.5%)	3 (37.5%)
S8	5 (62.5%)	4 (50%)	4 (50%)	2 (25%)
S9	6 (75%)	4 (50%)	7 (87.5%)	5 (62.5%)
S10	4 (50%)	4 (50%)	5 (62.5%)	4 (50%)
S11	3 (37.5%)	2 (25%)	2 (25%)	2 (25%)
S12	7 (87.5%)	8 (100%)	6 (75%)	6 (75%)
S13	6 (75%)	5 (62.5%)	6 (75%)	3 (37.5%)
S14	4 (50%)	5 (62.5%)	3 (37.5%)	2 (25%)
S15	2 (25%)	2 (25%)	3 (37.5%)	2 (25%)
S16	8 (100%)	8 (100%)	7 (87.5%)	8 (100%)
Mean	5.38 (67.19%)	5.06 (63.28%)	4.88 (60.94%)	4.38 (54.69%)
Std. Dev.	2.19 (27.34%)	2.14 (26.80%)	2.00 (24.95%)	2.19 (27.34%)

For long-term (two-week) retention measured by VKS scores, descriptive statistics in Table 4 showed that prior to the English idiom learning tasks, on pretests I and II the participants' average scores were 11 (SD = 1.51) and 10.88 (SD = 1.36), or 27.5% (SD = 3.77%) and 27.19% (SD = 3.4%) respectively. Through the co-construction of target idiom knowledge within collaborative dialogue episodes during SCMC-based collaborative interaction, their average scores increased 21.31 (to 32.31, SD = 3.98) or 53.28% (to 80.78%, SD = 9.95%) on long-term delayed posttest I, and 21.12 (to 32, SD = 3.39) or 52.81% (to 80%, SD = 8.47%) on long-term delayed posttest II. It follows that

despite the differences in previous knowledge (as revealed by different pretest scores), the participants' multiple encounters with the target idioms, including the attainment of receptive knowledge during the idioms-in-context tasks, productive use in the text-reconstruction tasks, and verbal reflections in the stimulated recalls, helped familiarize them with and fostered their long-term internalization of the definitions.

Table 5. Means and standard deviations of pretest and long-term delayed posttest scores (N=16)

Participants	Pretest I scores (Percentages)	Long-term delayed posttest I scores (Percentages)	Pretest II scores (Percentages)	Long-term delayed posttest II scores (Percentages)
S1	10 (25%)	39 (97.5%)	12 (30%)	38 (95%)
S2	10 (25%)	30 (75%)	10 (25%)	31 (77.5%)
S3	9 (22.5%)	26 (65%)	11 (27.5%)	27 (67.5%)
S4	10 (25%)	32 (80%)	9 (22.5%)	34 (85%)
S5	12 (30%)	37 (92.5%)	10 (25%)	33 (82.5%)
S6	10 (25%)	36 (90%)	12 (30%)	34 (85%)
S7	10 (25%)	29 (72.5%)	9 (22.5%)	30 (75%)
S8	14 (35%)	35 (87.5%)	13 (32.5%)	31 (77.5%)
S9	11 (27.5%)	33 (82.5%)	12 (30%)	36 (90%)
S10	12 (30%)	34 (85%)	9 (22.5%)	30 (75%)
S11	9 (22.5%)	28 (70%)	11 (27.5%)	25 (62.5%)
S12	11 (27.5%)	34 (85%)	13 (32.5%)	33 (82.5%)
S13	14 (35%)	32 (80%)	12 (30%)	30 (75%)
S14	12 (30%)	31 (77.5%)	11 (27.5%)	35 (87.5%)
S15	11 (27.5%)	25 (62.5%)	10 (25%)	30 (75%)
S16	11 (27.5%)	36 (90%)	10 (25%)	35 (87.5%)
Mean	11 (27.5%)	32.31 (80.78%)	10.88 (27.19%)	32 (80%)
Std. Dev.	1.51 (3.77%)	3.98 (9.95%)	1.36 (3.4%)	3.39 (8.47%)

The reflective journal from one participant, who did not demonstrate variation in her patterns of interaction across the two types of tasks, also reflected the benefits of the passive role she took on during her collaboration with her partner for her idiom learning, as she noted,

My partner and I started by reading the example sentences given with the idioms. Then, we guessed the meaning based on the context and checked whether the meaning fits or makes sense when placed in the example sentences. If we both think the meaning we guess can act as a substitution to the idiom, we will assume it is the meaning to the idiom. We also corrected the idioms through our discussion of why they are incorrect and which idiom is the best fit. I think the collaboration is quite useful for my understanding of the meaning of the idioms because I can remember it better since I had discussed and used them a couple times in real life.

CONCLUSION

The analyses of the data revealed the presence of the four patterns of interaction that had been documented in previous research on face-to-face communication (e.g., Storch, 2002), notably collaborative, expert/novice, dominant/dominant/ and dominant/passive. Dyads were identified as exhibiting the collaborative pattern if they were high on equality and moderate and high on mutuality. These patterns were evident when the members of the dyad were able to make approximately equal contributions to the solutions to the tasks, exchange ideas and share opinions constantly, and converge on the meaning of the bulk of the target idioms. The expert/novice dyads, on the other hand, were moderate to low on equality and moderate to high on mutuality, as seen when the more capable dyad member (the expert) took more control over the discussions, and encouraged and assisted in the less capable one's (the novice) participation. Both collaborative and expert/novice were the collaborative orientations that resulted in more words and turns produced during online exchanges and more time spent on the tasks. In contrast, dyads that adopted the dominant/dominant pattern were high on equality and moderate to low on mutuality. This was evident by the inadequacy of involvement with each other's views, lack of compromises, and inability to reach consensus on the meaning of most idioms. The dominant/passive pattern, furthermore, was characterized by the few instances of collaborative dialogue, the dominance of one dyad member who appropriated the tasks and imposed his or her opinions, and the submission of the other one who barely expressed his or her thoughts. Both dominant/dominant and dominant/passive were the non-collaborative orientations, which produced fewer words and turns and spent less time on the tasks. An additional finding of particular interest is the influence of the nature of the tasks and the increase in the dyad members' knowledge of the meaning of the target idioms on the patterns of interaction they engaged in. Despite these differences, it appeared that all dyads had developed their knowledge about the meaning through their multiple exposure to the target idioms.

From the viewpoint of theoretical implications, as the notion of collaborative dialogue suggested, during dialogic interaction, the utterances produced by the speakers evidenced their cognitive processes and became the objects for further reflection. In other words, "dialogue that arises during collaborative problem-solving is an enactment of cognitive activity" (Swain & Lapkin, 1998, p. 322). In the case of this study, in discussing the meanings in relation to the context of the idioms with their partners, the participants revealed their thoughts and had a deeper understanding of the status of their interlanguage; that is, what they could and could not express in English at the moment. Additionally, through the co-construction of collaborative dialogue, the participants were more conscious of the problems in their L2 production. In attempting to improve the precision, clarity, and appropriateness of their messages, they practiced explaining and arguing over the meaning of the target idioms through the use of L2 and therefore expanded their linguistic repertoire. It follows that the development of L2 lexical knowledge can be achieved through not only individual but also collaborative efforts by virtue of languaging. This process, furthermore, seems to be facilitated by the written

mode of SCMC, in which the participants were allowed to more readily monitor their own language production and detect the problems in their L2 use.

Teaching implications drawn from this study is that the use of collaborative work can be successful for English teaching and learning. As can be observed from the collaborative interaction in this study, the patterns of interaction appeared to be quite influential in terms of the co-construction and internalization of the meanings of the target idioms. As such, to be able to form the collaborative orientations, it is essential that English learners recognize the important roles each dyad member play in pooling their linguistic resources for the solutions to the language problems they encounter. This can be compounded in an online chat environment by the occasional discontinuity between requests for assistance and appropriate responses. Therefore, English learners should be informed of the importance of producing clear and coherent discourse to the success of collaboration in the cyber space, and be provided the kind of instruction that focuses on the content and conduct of the tasks.

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