



Investigating linguistic, literary, and social affordances of L2 collaborative reading

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Abstract

This exploratory study analyzes learner–learner interactions within a virtual environment when collaboratively reading Spanish poetry in a Hispanic literature course at the college level via an ecological theoretical perspective (van Lier, 2004). The goals of the study are (a) to present empirical data that illustrate the theoretical construct of affordance in a virtual, collaborative reading environment, and (b) to investigate the pedagogical ramifications of using a digital annotation tool to involve learners in collaborative reading. Three distinct types of affordances emerged in the data: linguistic, literary, and social affordances. Our findings indicate that the number of literary and social affordances outnumbered the linguistic affordances that emerged in students’ threaded discussions while collaboratively reading and annotating poems. In addition, the primary challenges for learners when engaging in collaborative reading included others’ comments impeding some students’ understanding of the text, and having to make one’s comments distinct from others’ comments to avoid being socially viewed as an inactive reader or student. From a pedagogical perspective, the primary benefits of incorporating collaborative reading in a second language poetry course involve the ability to establish a more open learning community and allowing students to carry out a closer reading of literary texts.

Keywords: *Digital Literacies, Multiliteracies, Reading*

Language(s) Learned in this Study: *Spanish*

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Introduction

Over the last two decades, reading has begun to shift from a print-based experience to one that is primarily carried out in a digital environment due to the proliferation of a myriad of technological tools and reading devices. This change has resulted in learners attempting to transfer and, at times, re-think their reading strategies with digital texts (Hayles, 2012; Park, Zheng, Lawrence, & Warschauer, 2013). Digital annotation tools (DATs) facilitate the development of new, digitally based reading strategies by allowing learners to highlight digital texts with multiple colors and to add text-, video-, and picture-based annotations, among other features, such as tag or comment clouds, heat maps of annotations, and integrated dictionary search fields. In-text annotations are suggested by some to be beneficial to learners because they are easily accessible and thus do not interrupt learners’ reading activity (Glover, Xu, & Hardaker, 2007). DATs also allow learners to share annotations, which subsequently means that reading is no longer simply an individual process but can also be a collaborative one (Novak, Razzouk, & Johnson, 2012). Blyth (2014) refers to this kind of activity as digital social reading, which he defines as “the act of sharing one’s thoughts about a text with the help of tools such as social media networks and collaborative annotation” (p. 205). While some fear that digital reading will ultimately replace print-based reading, Blyth argues that digital reading is yet another form of literacy, which requires a different set of reading skills.

Much of the research on annotating and text marking has been carried out with first language (L1) learners

using both digital and print-based texts (e.g., Chen & Chen, 2014; Li, Pow, & Cheung, 2015), and findings reveal that annotations assist in the development of various skills, for example, the development of vocabulary and the cultural significance of text. Some research (e.g., Koda, 2007; Sparks, Patton, Ganschow, & Humbach, 2009) suggests that skills learned in the L1 can be transferable to the second language (L2). It is possible that annotations might help L2 learners not only to isolate and remember new vocabulary or better understand specific grammatical structures, but also to monitor their understanding of a text as they decode an L2 reading. In addition, by sharing annotations with others, learners have the possibility to gain insights into culturally dense aspects of a text, many of which might have otherwise been misunderstood or ignored altogether. In sum, allowing students the ability to share written digital feedback or annotations with others while reading in an L2 environment may not only enhance learners' understanding of the historical or cultural frameworks in which the texts were created, but also facilitate the acquisition of the L2 itself (for other benefits, see Chun, 2011).

With the rise of digital reading as a new form of literacy, coupled with the emergence of a number of DATs, it is imperative that the reading process and strategies used in L2 digital environments are better understood for the development of future DATs and for the benefit of learners, practitioners, and researchers alike. As more content is delivered and read in online environments via an increasing number of digital L2 textbooks and other authentic L2 reading materials, additional research is needed to fully understand the benefits and potential drawbacks of using DATs in L2 teaching and learning environments. Similarly, much more work is needed related to the commonly used—yet rarely operationalized—theoretical construct of affordance (van Lier, 2004); one of the primary aims of this present study.

Literature Review

DAT Research in L2 Contexts

To date, the majority of research focusing on the use of DATs in language learning environments has primarily been carried out with learners in L1 settings (e.g., Gao, 2013; Lu & Deng, 2013; Yang, Yu, & Sun, 2013). As a result, there are only a handful of studies that have investigated the effects of using DATs in L2 learning and teaching contexts. Nor, Azman, and Hamat (2013) used DATs for pre-service English-as-a-foreign-language (EFL) teachers in a university setting in Malaysia. The nonnative English participants were asked to read a supplemental article in English (i.e., participants' L2) regarding their coursework in language education. After annotating the document with their classmates, they were given a survey. Nearly 85% of the participants reported that sharing notes was essential to their understanding of the article and 77% of the participants noted that highlighting the article facilitated their comprehension of the text.

Another study (Tseng, Yeh, & Yang, 2015) investigated the effects of annotating a text on three different levels of reading: surface-based, text-based, and situation-based. The surface-based questions targeted understanding of basic vocabulary, the text-based questions targeted specific information within the text, and the situation-based questions focused on whether or not students could make connections between ideas within the text. The researchers found that of the 50 English-as-a-second-language (ESL) participants, 20 of them made gains at all three levels, 21 made gains at the surface- and text-based levels, and 9 made significant gains at the surface-based level. They then correlated these results with the types of annotations made by the students who demonstrated gains at each level. Tseng et al. argue that learners who used the annotations to mark vocabulary words made gains at the surface-based level, those who used annotations primarily to comment on the article made gains at the text-based level, and those who predominantly used annotations to summarize the text made gains at the situation-based level.

In yet another study with EFL learners, Chang and Hsu (2011) developed a DAT on a handheld device for upper-elementary learners. The program allowed the participants not only to share notes with group members, but also to receive an automatic translation of vocabulary in the text. It should be noted that the in-app dictionary provided every possible translation, and thus learners were still required to choose the definition that they felt best fit the context. The researchers found that when students read the digital

readings in pairs, they performed significantly better on a reading comprehension task than when they read it individually.

Overall, the research on DATs in the L2 context to date has been done primarily with EFL and ESL learners. Much like the existing literature on DATs in the L1 context, the research has focused on perceptions of DATs and the effect of using these tools on overall reading comprehension performance. While research does show positive results in terms of reading performance levels and perceptions of DATs, much more work is needed to determine how learners of other L2s engage in collaborative digital reading and how DATs might influence the development of learners' L2 reading ability or facilitate the acquisition of vocabulary and grammatical competence. In addition to better understanding the nature of any potential linguistic affordances, more work is needed that also looks at how DATs might lead to social and literary affordances for learners engaged in reading advanced-level L2 literary texts (e.g., poetry). In short, this study seeks to fill a void in the literature regarding how social reading in an L2 virtual environment might give rise to linguistic, literary, and social affordances which, in turn, may facilitate L2 reading. To understand the potential affordances of DATs when learners are engaged in collaborative reading, we have chosen to make use of an ecological perspective on L2 learning.

Ecological Theoretical Perspectives on L2 Learning and the Affordance Construct

Over the last 20 years, the field of second language acquisition (SLA) has become increasingly interested in understanding how social and contextual factors related to the learner and inherent in an L2 environment affect acquisition. Some researchers have relied on ecological views and constructs originating in psychology (Bronfenbrenner, 1979; Gibson, 1979) and applied them to a range of L2 learning contexts (e.g., Lafford, 2009; Miller, 2005; Palalas & Hoven, 2013; Thoms, 2014; van Lier, 2000, 2004).

With respect to the relationship between language learners and their learning context, van Lier (2000) indicates that from an ecological point of view, the learner “is immersed in an environment full of potential meanings. These meanings become available gradually as the learner acts and interacts within and with this environment” (p. 246). From a theoretical perspective, it has been suggested that “the recent metaphor of *ecology* attempts to capture the *interconnectedness* of psychological, social, and environmental process of SLA” (Lam & Kramsch, 2003, p. 144, italics in original). That is, a number of learner- and context-based factors work together in concert to give rise to affordances in the learning environment (van Lier, 2000).

Gibson's (1979) work in psychology originally defined an affordance as a characteristic that is embedded in an environment that an organism perceives as being helpful (or not) at a particular point in time. Van Lier (2004) went further and indicated that affordances are not static or permanent features embedded in an organism's environment, but suggested that affordances emerge out of the interactions between the organism and its environment. In an L2 context, “the affordance perspective assumes an active learner establishing relationships with and within the environment. In terms of language learning, affordances arise out of participation and use, and learning opportunities arise as a consequence of participation and use” (Auyang, 2000, as cited in van Lier, 2004, p. 92). Therefore, on a theoretical level, one can view affordances as learning opportunities that present themselves via an active learner who is engaged with the L2 learning environment—be that a physical or virtual classroom context.

While an ecological theoretical perspective is no longer new to the field of SLA, there is still a paucity of research that has operationalized and illustrated the affordance construct. In addition, only a handful of CALL researchers have made use of an ecological perspective to inform their work (e.g., Lafford, 2009; Palalas & Hoven, 2013; Thorne, Fischer, & Lu, 2012). Perhaps the most relevant CALL study to date that provides a definition of affordance is Darhower's (2008) project that illustrated the linguistic affordances that resulted in a telecollaborative text-based chat between native Spanish speakers in Puerto Rico and college-level, nonnative Spanish learners from the United States. He defined a linguistic affordance as “any discursive move that provides linguistic information to a learner, or that intends or appears to activate a learner's awareness of specific language structures and/or lexical meaning” (p. 50). After analyzing the chat logs at the end of nine weeks, Darhower illustrated a number of linguistic affordances, such as checking

comprehension, clarifying non-comprehension, providing information, providing translation, providing word meaning, reformulating implicitly, and requesting help, among others.

The present study builds on Darhower's (2008) work and contributes to the nascent research in this area by offering interpretations of the construct of affordance in the context of asynchronous, virtual interactions among college-level learners while collaboratively reading Spanish poetry via a DAT called Hylighter. We investigate the following research questions:

1. What is the nature of the linguistic, literary, and social affordances for learners when engaging in collaborative reading of Spanish poetry in a virtual environment?
2. What are the challenges and constraints for learners when engaging in collaborative reading in a virtual environment?
3. What are the primary benefits and challenges of incorporating collaborative reading in a university-level Spanish poetry course via a DAT from an instructor perspective?

Methodology

Course context

The study site was an undergraduate Hispanic literature course offered at a large university in the Western region of the United States. The course focused on the poetry of Federico García Lorca and Pablo Neruda and was offered to students who were either in the last semester or penultimate semester of their undergraduate Spanish studies. All of the students had already taken several Spanish language, culture, and literature courses before enrolling in this particular class. As a result, most students were familiar with reading, comprehending, interpreting, and talking about Hispanic literature in Spanish. The course met in the evening once a week for two hours and thirty minutes. It was taught in Spanish, and many of the primary texts and a majority of the secondary texts assigned to students were written in Spanish; some of the texts were bilingual editions. The course embraced a seminar approach, where the teacher and his students often engaged in face-to-face, whole-class discussions to analyze and interpret the meanings of the various poems.

Participants

Fifteen undergraduate students participated in the study, 11 males and 4 females, ranging in age from 21 to 28 years old. All of the students were Spanish majors and all but one indicated that their native language is English; one student indicated that English and Portuguese are her native languages. Survey data indicated that the majority of students used a personal computer and a smart phone on a daily basis, while four students indicated that they also used a tablet (e.g., iPad) each day. On average, students indicated that they used the aforementioned devices a little over 3 hours per day. When asked about how many hours they spend reading print-based text (e.g., textbooks, traditional newspapers) versus digital text (e.g., websites, digital newspapers) during a typical day, students responded that on average they spent 2 hours 45 minutes reading print-based texts and 1 hour reading digital texts.

The instructor of the course, John (a pseudonym), was an Assistant Professor who had been teaching in the Spanish section of the department for six years at the time of the study. He was considered to be an experienced teacher given that he had taught various upper-level Hispanic literature courses. His native language was English, and he had near-native oral proficiency in Spanish.

The Hylighter Tool

DATs can be divided into two general categories: those with a private domain and those that allow the annotation of public web pages. Diigo, Annotary, and Ponder are examples of annotation tools that allow users to highlight or annotate public webpages and share the annotations with others. In the case of Ponder, users install the annotation tool within any browser and then read and annotate or comment on public webpages via micro responses (i.e., short, pre-made or teacher-created words and expressions that describe

the selected text). One student's annotations or micro responses are then archived and can be shared with fellow students and the instructor. Tools with a private domain such as Hylighter (Lebow, 2012), eMargin (Kehoe & Gee, 2013), and eComma (Blyth, 2013), require that users first create an account and then upload and share a document to be annotated. Once the document is uploaded and shared, other users can read the text, make comments, and tag different aspects of the text such as vocabulary words, grammatical structures, or rhetorical devices (e.g., metaphors). A threaded discussion is often created based on the specific parts of the text being highlighted by learners (see Figure 1).

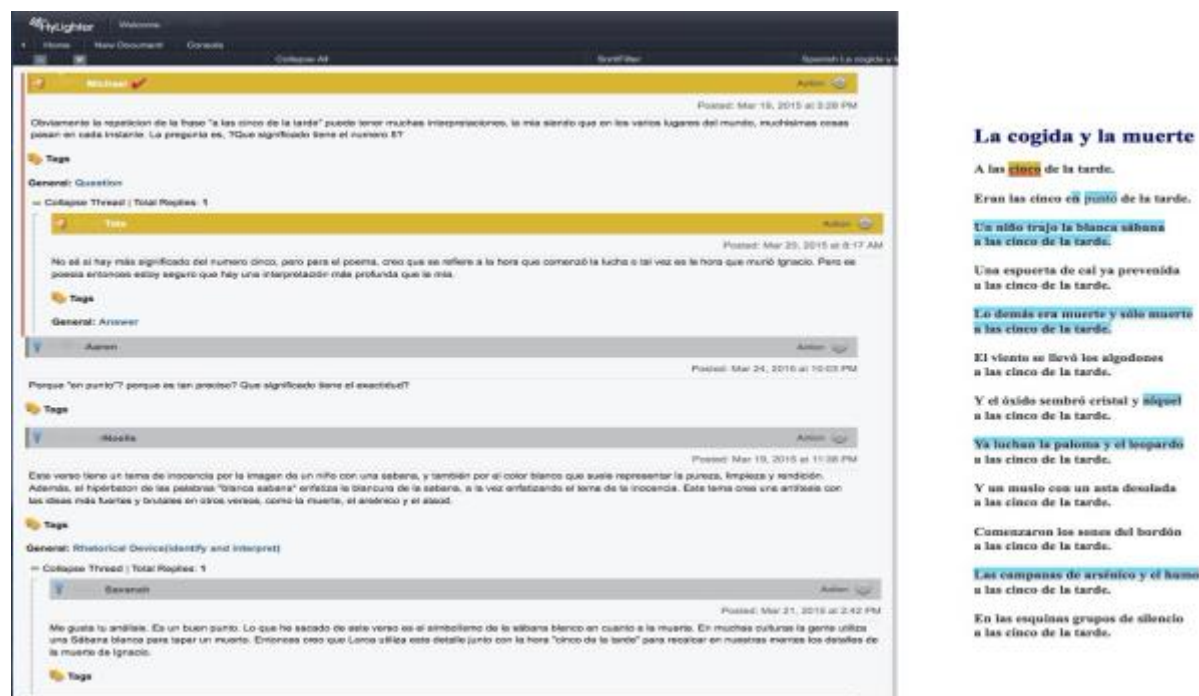


Figure 1. Interface of Hylighter

These tools offer a variety of features for readers to employ before, during, and after reading. Some allow for the creation of word clouds based on the vocabulary used in the uploaded text. Students can use the generated word cloud to preview important vocabulary before they begin the reading process. Hylighter also enables readers to tag certain aspects of the text and then later sort the tags. For example, readers can potentially use a tag to label a specific grammatical form or lexical item that they did not understand. The instructor or the students themselves can then filter the tags making the grammatical aspects more apparent or the confusing vocabulary more noticeable. According to Glover et al. (2007), to make full use of the Internet and current technology, an annotation system should allow users the ability to create graphical annotations, linking annotations, shared annotations, and annotation reports. Glover et al. also argue that there is a need for a way to keep annotations private as some learners may avoid commenting for face-saving motives.

For this study, students only used Hylighter's basic annotation feature and the tagging function when making comments on the L2 Spanish texts. However, due to technical issues with the tagging feature reported by some students, we chose to only focus on how students used Hylighter to annotate or make comments on the poems. While Hylighter also created log files for individual students (e.g., time and date stamps whenever students accessed the readings), these files were limited in scope and therefore did not allow researchers the ability to more closely examine how each learner engaged with each text (e.g., where and when they clicked on certain parts of the digital readings) via the Hylighter tool.¹

Finally, it should be noted that Hylighter was used in this study for two reasons. First, one of the researchers

had experimented with the tool and appreciated some of the back-end features such as how easy it was from a research perspective to collect and sort readers' annotations and tags. Secondly, the researchers learned, after consulting with the tool's creators, that it had primarily been used by corporate customers and had never before been employed in an L2 learning or academic environment. As such, the researchers were granted free access to the tool and decided to use it for the aforementioned reasons.

Data Collection and Procedures

Data collection took place during the Spring 2015 semester. The researchers, in collaboration with John, determined that students would be assigned to read three to five of the various poems assigned each week via Hylighter during a 4-week period in the middle of the semester. In all, students read and commented on 18 poems via Hylighter for this study. One of the researchers worked with John to determine which days and what poems would be read via Hylighter. The only criteria used to select which poems would be digitized and read each week involved selecting poems that were an appropriate length and ensuring that roughly the same amount of text was assigned each of the four weeks. The difficulty levels of the poems read in Hylighter across the four classes was not considered.²

It should be noted that the course syllabus indicated that 30% of a student's grade consisted of the student carrying out 10 mini-analyses of the poems that were assigned each week throughout the entire semester. The 200-word mini-analysis assignments involved students reacting to the poems assigned for a particular class by pondering questions such as *What is the most significant part of the reading and why?* and *What rhetorical devices does the author/poet use to communicate his/her message?* In addition, students were asked to write two to three questions related to the text that they would like to discuss in more detail in class. The mini-analysis homework activities were done individually by students outside of the classroom. For the poems that were read over the 4-week period of the study, John and the researchers decided that in lieu of having students turn in the mini-analysis homework, they would require a version of the mini-analysis be done virtually via students' comments and annotations of the four poems that were read in Hylighter (for a sample mini-analysis homework assignment, see [Appendix A](#)). Students therefore knew that their virtual comments were going to be graded and treated just like any other mini-analysis assignment. In all, students' contributions to Hylighter over the course of the 4-week study represented the equivalent of doing four mini-analyses. The Hylighter contributions therefore represented 12% of each student's final grade in the course.

The new virtual mini-analysis assignment involved each student making at least one comment on each of the assigned poems read in Hylighter by midnight on Saturday of each week. This allowed students Wednesday–Saturday to read and make initial annotations and comments on the assigned poems. From Sunday to Tuesday evening, students were asked to respond to another student's comment on each of the poems. It is important to note here that students were not encouraged to make a specific number of language-, literary-, or socially oriented comments and annotations. The researchers and instructor simply asked them to make an initial comment on each of the assigned poems for that particular week and then make an additional comment on other students' original comments for each poem. Nevertheless, the researchers did explain to the students some of the pedagogical benefits of using Hylighter when reading the poems, namely the ability to ask each other a wide range of questions about topics such as grammar and vocabulary, interpretation, and historical references in the poems, among others.

Once students received information on how to use the various features in Hylighter and were allowed to experiment with those features via two sample digital texts during a 50-min training session, they then began commenting on the various poems each week during four consecutive class meetings. The primary source of data for our study was comprised of students' comments and annotations made via Hylighter when reading 18 poems over the course of the 4-week data collection period. Qualitative analysis of students' comments in their threaded discussions in Hylighter was carried out partially based on the tenets of grounded theory (Charmaz, 2006). This approach holds that “theories or ideas about the social and psychological processes of language learning become ‘grounded’ in data from the field and, more specifically, in the actions, interactions, and social processes of learners” (Young, 2012, p. 537).

One researcher initially read through the student comments made on all 18 poems in Hylighter. That initial pass resulted in the creation of categories based on the characteristics of students' comments and digital annotations. Features of students' comments were noted and a description of each category was determined. The researchers discussed each of the categories and agreed on how each one was defined based on the first pass of the data. The other researcher then read through and coded all student comments based on the categories established by the first researcher. Upon comparing the results of each coding pass, the interrater reliability for the raters was found to be $\kappa = 0.889$ ($p < 0.001$). However, both researchers discussed the differences in coding and any remaining discrepancies were resolved. In all, 13 categories of students' comments and annotations were defined. Of those 13, the researchers determined which ones were linguistic in nature, which ones dealt more with literary aspects of the reading or reactions to the reading, and which ones were primarily social. As such, three principle categories—described and illustrated below as linguistic, literary, and social affordances—were established (see [Appendix B](#) for the various coding categories and corresponding affordance types).

Other data sources for this study included a survey that was taken by all students at the end of the project along with interviews carried out individually with four focal students and John. The four students were chosen based on their active participation via the comments they made on the various poems in Hylighter and their willingness to participate in an interview. They were interviewed at the end of the data collection period. Similarly, John was also interviewed to gain a better understanding about the pedagogical aspects of using the DAT in his Spanish poetry class. As with the student comments made in Hylighter, the researchers also read through and coded the four focal student interview transcriptions as well as John's interview comments based on themes that emerged from the interview data. The interrater reliability for the focal student interview data was found to be $\kappa = 0.847$ ($p < 0.001$) while the interrater reliability for John's interview data was $\kappa = 0.840$ ($p < 0.001$). Given that ecological views of language learning often include the perceptions of multiple participants in a learning environment, having the four focal students and the instructor comment on similar aspects of the virtual interactions allowed for a more complete understanding of the various linguistic, literary, and social affordances that emerged in the annotations and related threaded discussions.

Definitions of Affordances

Given that one of the goals of this study is to define and illustrate the linguistic, literary, and social affordances that emerged from the interactions of learners when collaboratively reading a text via a DAT, it is necessary to define each type of affordance as operationalized in this study. Similar to Darhower's (2008) definition, a linguistic affordance in this study involves any discursive move that provides explicit linguistic information to the learner, such as information regarding grammatical structures or lexical meaning. A literary affordance is any discursive move that expresses insights related to textual analysis, such as a learner's interpretation of the meaning of a text, another learner's expansion of that interpretation, or a comment related to rhetorical devices used by the poet. Finally, a social affordance is defined as any discursive move that provides encouragement, expresses one's opinion about another's comment (e.g., signaling agreement or disagreement), or provides a comment that is not directly related to the text under analysis.

Results and Discussion

The results of this study are answered based on the three research questions under investigation.

Research Question 1

What is the nature of the linguistic, literary, and social affordances for learners when engaging in collaborative reading of Spanish poetry in a virtual environment?

Three distinct affordances emerged from the students' interactions when collaboratively reading, annotating, and commenting on the various poems in Hylighter. Throughout the four weeks of the study,

students made 562 comments across the 18 poems³ (see Table 1). Of the 562 comments, 65.3% were coded as literary affordances, 53.6% were determined to be social affordances, and 7.5% were coded as linguistic affordances.

Table 1. Total Number of Comments and Annotations

	Week 1	Week 2	Week 3	Week 4	Total
Initial Comments	66	84	65	68	283
Replies	66	79	69	65	279
Total Posts	132	163	134	133	562

The data clearly show that both the literary and social affordances that emerged outnumbered the linguistic affordances. The low number of linguistic affordances may be attributed to the facts that (a) this course was an advanced literature class where students' overall linguistic ability or proficiency may indicate that they simply did not need as much assistance from others regarding the grammatical or lexical structures in the poems, and (b) students felt compelled to focus on understanding and interpreting the poems due to the guiding questions outlined for students in the weekly mini-analysis tasks. It is worth noting that in addition to both the literary and social affordances emerging most often in students' comments and annotations, both types of affordances also tracked higher by the end of Week 4 while the overall number of linguistic affordances trended downward.

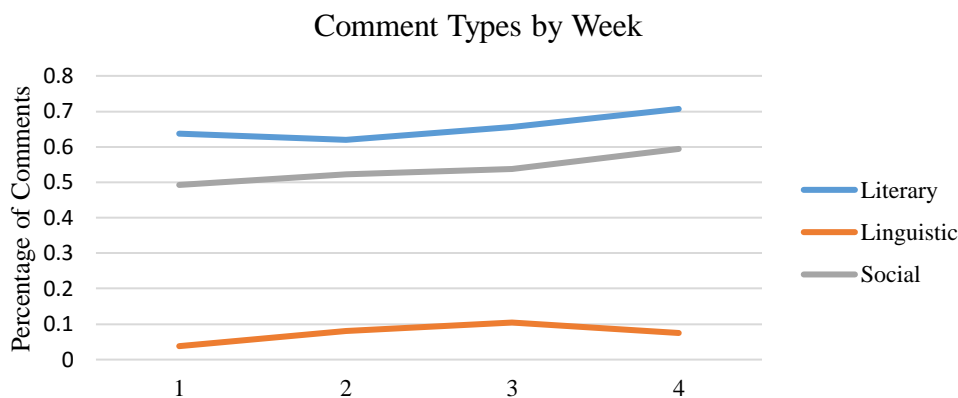


Figure 2. Weekly rates of three affordances

Note. Given that some comments/annotations were coded as more than one type of affordance, these percentages will calculate beyond 100%.

One of the goals of this study is to understand to what extent a digital social reading tool could advance the operationalization of the construct of affordance. We now present a purposive sample (Robson, 2011) of the three types of student comments and annotations that emerged from the data and explain how each represented potential affordances for student learning. It is important to underscore that this study does not attempt to measure the potential long-term impacts of the three different affordances on L2 learning and teaching. In other words, we are unable to claim to know how learners may have used the three types of affordances to facilitate their understanding of the poems that were collaboratively read in Hylighter or how the affordances may have facilitated their acquisition of Spanish. Rather, the purpose of illustrating the three distinct affordances is to begin to exemplify and illuminate how the theoretical construct of affordance (Thoms, 2014; van Lier, 2004) might be operationalized in the context of a virtual L2 reading environment to serve as a basis for future empirical work related to the affordance theoretical construct.

Excerpt 1 provides an example of a linguistic affordance found in the data. Two coding categories, lexical and grammatical, made up what we identify as a linguistic affordance. In other words, students' comments and annotations that dealt with issues related to a grammatical or lexical question or query were coded as such and then were combined and determined to be linguistic affordances. In this sample interaction, student A highlighted the words *corazón amortajado* in the poem, which mean *shrouded heart* in English. His corresponding comment first defined the word *amortajado* and then was followed by a comment about the meaning of the image of a shrouded heart. Students B and C both replied to Student A's original comment by confirming the English meaning of the word *amortajado* and then offering additional insights and interpretations of the image by referencing other aspects of the poem (i.e., images of the sun).

Excerpt 1. Sample Linguistic Affordance

Student A: *"Amortajado" significa "to shroud". Es interesante esta imagen de como el sol penetra su corazon cerrado.*

[*"Amortajado" means "to shroud". This image is interesting regarding how the sun penetrates his closed heart.*]

Student B: *Para mí la frase "corazón amortajado" significa que su corazón ya había puesto a ser enterrado. No tenía esperanza pero cuando viene el sol había suficiente esperanza para darle vida otra vez.*

[*For me the phrase "shrouded heart" means that his heart has already been buried. He didn't have any hope but when the sun comes, there was sufficient hope to give him life once again.*]

Student C: *si el significado en ingles es shroud. Es como si el corazon estuviera cubierto y ya duro por tanto sufrimiento en el pasado.*

[*yes, the meaning in English is shroud. It is as if the heart were covered and already hardened due to so much suffering in the past.*]

As previously noted, literary affordances outnumbered both the social and linguistic affordances identified in the data. A possible explanation for the high number of literary affordances may relate to the fact that this particular course was an advanced-level poetry course where one of the pedagogical foci involved allowing students the discursive space—both in the physical classroom and online in Hylighter—to interpret the meanings of the poems based on close readings of the text. Hylighter allowed for students to visually indicate a particular aspect of the text *in situ* (i.e., textual evidence) while also commenting on how they interpreted the text. Again, a literary affordance in this study is defined as any discursive move that expresses insights related to textual analysis, such as a learner's interpretation of the meaning of a text, another learner's expansion of that interpretation, or a comment related to rhetorical devices used by the poet.

Excerpt 2 illustrates a literary affordance that was commonly found in the data. In this specific example, this literary affordance involves both the student interpreting the text while also making a comment about a rhetorical device used by the poet (in this case, anaphora). Student A highlighted the interjection *¡Ay!* in the poem and proceeded to comment on the rhetorical use of the expression while offering an interpretation of the expression and how it affected the tone of the poem. Student B replied to Student A's comment with personal views about the use of word *¡Ay!* and an opinion of why the poet used it in the poem's title.

Excerpt 2. Sample Literary Affordance

Student A: *Ya hemos hablado de la palabra "ay" en la clase. La anafora que emplea el autor al repetir la palabra "ay" hace que el tono del poema sea un tono triste, oscuro, lleno de dolor. Cada vez que se repite "ay" me hace pensar en un llanto, un grito de agonía. Cada cosa que describe es algo que le pica el corazón y le hace sentir un dolor tan fuerte que le hace gritar ¡ay! Es como si*

cada cosa que hace su amante o cada recuerdo que tiene le hace sentir un dolor que le hace gritar en agonía.

[We have already talked about the word “ay” in class. The anaphora that the author employs upon repeating the word “ay” makes the tone of the poem be sad, dark, full of pain. Each time that “ay” is repeated makes me think about a cry, a shout of agony. Each thing that it describes is something that picks at the heart and makes it feel such a strong pain that it makes it yell oh! It is as if each thing that his lover does or every memory that he has makes him feel pain that makes him scream in agony.]

Student B: Creo que esta es la primera vez que realmente he visto la frase utilizada en el título. Creo que lo hace para que pueda capturar sus admiradores literarios desde el primer momento.

[I think that this is the first time that I have really seen the phrase used in the title. I think that he does this in order to capture his literary admirers from the first moment.]

Finally, the second most common affordance identified was a social affordance. Social affordances entailed any discursive moves that expressed one student’s opinion about another student’s comment (e.g., signaling agreement or disagreement) or involved a comment that was not directly related to the poems (e.g., citing a personal reference or a non-literary or non-linguistic remark).

Student B’s response in [Excerpt 3](#) illustrates a social affordance that was commonly found in the data. In the sample interaction, Student B replied to Student A’s original comment regarding the symbolism of the moon and the image of night and darkness used in a poem written by Federico García Lorca. Student B first indicated that she not only liked Student A’s comment, but that she also agreed with his analysis. Student B then went on to offer her own interpretation of the symbols found in the poem and provided some additional information to help her make her point (i.e., a link to a website that offers an explanation about willow trees).

Excerpt 3. Sample Social Affordance

Student A: La luna es un símbolo que representa la noche y la oscuridad. Quiere que sea noche para que puede dormir y tratar de no sufrir cómo está sufriendo ahora. También puede ser que quiere que sea noche para no ver la sangre. Cuando es noche no se puede ver la sangre por la oscuridad. Es cómo que la oscuridad esconde lo que no quiere ver.

[The moon is a symbol that represents the night and darkness. He/she wants the night so that he/she can sleep and try not to suffer like he/she is suffering now. It can also be that he/she wants it to be night in order to not see the blood. When it is night one can’t see blood due to the darkness. It’s like the darkness hides that which one cannot see.]

Student B: Me gusta tu idea. Estoy de acuerdo que quiere que sea la noche para poder dormir y olvidar. También he leído que la luna y las sauces tiene magia. El sitio dice “Obrar magia que combine la Luna, el agua y el sauce crea una especie de trinidad mágica.” como el sauce está mencionado en la siguiente estrofa no sé si Lorca quería transmitir algo con esto?

<http://www.taringa.net/post/ecologia/15482385/El-arbol-sauce-y-su-significado.html>

[I like your idea. I agree that he/she wants it to be night in order to be able to sleep and forget. I have also read that the moon and willows are magical. The site says “To work magic that combine the moon, water, and the willow tree creates a kind of magical trinity.” Like the willow that is mentioned in the next verse...I don’t know what Lorca wanted to transmit with this? <http://www.taringa.net/post/ecologia/15482385/El-arbol-sauce-y-su-significado.html>]

Finally, [Figure 3](#) provides an overview of the distribution of the three types of annotations made on each of the 18 poems. This longitudinal view of students’ annotations reveals one interesting pattern. There appears to be an inverse relationship between the literary and social annotations. Specifically, there are two

instances (during Weeks 2 and 3) when a rise in the number of social annotations was correlated with a lowered number of literary annotations. Conversely, the rise in literary annotations for one of the poems during Week 4 was correlated with a lowered number of social annotations. Perhaps this is a natural phenomenon in that the more social students are when commenting in this kind of online, community-like environment, the less inclined they are to focus on the task at hand—in this case, making literary-based comments and annotations. Similarly, it is also possible to speculate that as more students provide more thought-provoking literary analysis via literary annotations, the entire group may become less inclined to inject socially oriented annotations for some reason. Unfortunately, neither the student survey data nor the focal student interview data revealed any insights about these kinds of correlations.

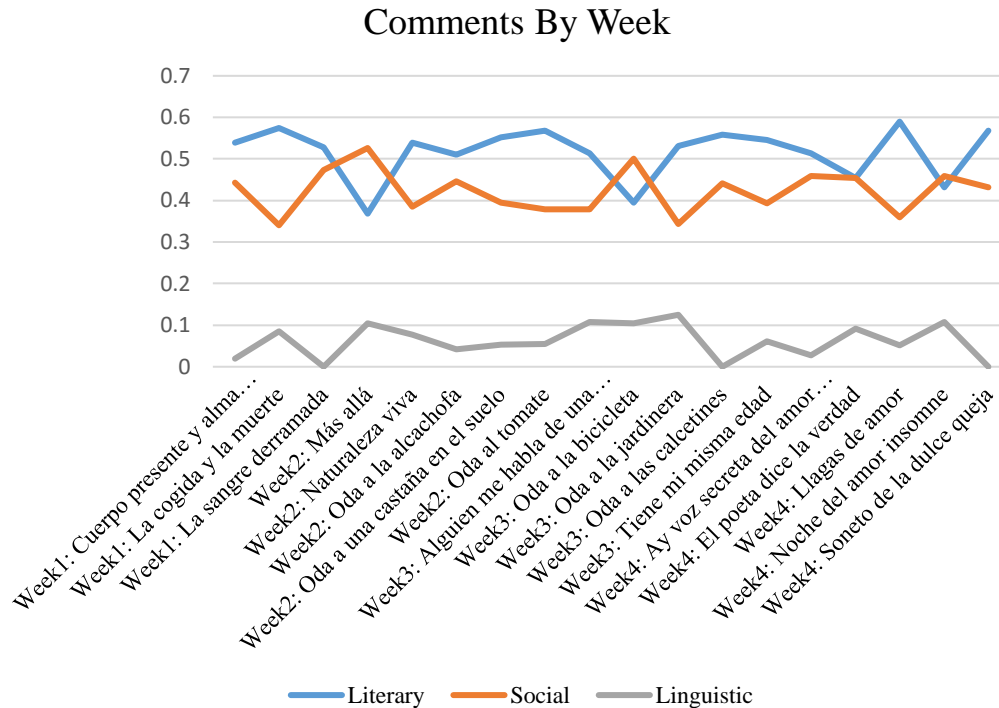


Figure 3. Weekly comments and annotations per poem.

Research Question 2

What are the challenges and constraints for learners when engaging in collaborative reading in a virtual environment?

While we have seen that the interactions carried out via Hylighter resulted in the emergence of three distinct types of affordances, we also determined whether or not students encountered any challenges or felt constrained in any way when using the DAT to collaboratively read and annotate the poems with their classmates. Analysis of the student survey and focal student interview data indicated three main constraints or challenges. The most common challenge of participating in collaborative reading mentioned by students involved the difficulty of making one's comment distinct from others' to avoid being perceived by fellow students and the instructor as someone who was not prepared or was not able to adequately interpret the literary text. When asked to expand on this aspect of collaborative reading, one focal student stated "people sometimes would have the same idea. And so now I gotta think of something new to write about it. And it was kind of, I don't want to say frustrating, but...you didn't want to look like you were just being lazy." The fact that we required students to make at least one initial comment on each poem, coupled with the shorter length of some of the poems, may have resulted in students feeling additional pressure to produce original or insightful comments and annotations.

The second most common challenge indicated by students was the fact that the open and digital nature of collaborative reading sometimes resulted in some students' comments or annotations impeding others' understanding of the text. One student stated that some of the comments and annotations made were "silly" and therefore not very useful. Other students commented on the fact that collaboratively reading a text sometimes resulted in a phenomenon described as "group think, when one person commented first with an inaccurate or incorrect statement, [and then] many other students would take the statement as truth." A focal student echoed this same idea when she stated:

Whenever I was on Hylighter, I would see people's comments as I was reading the poem which you know normally I wouldn't see, so I feel like sometimes that did kind of influence my ideas about the poem, which is not necessarily a bad thing, but at the same time it kind of prevented me from forming my own ideas about it because I was like being influenced by what other people were saying.

Finally, several students commented on the difficulty of reading a digital text versus a traditional, print-based text. Some indicated their preference to annotate directly on a printed page; they would then rely on those notes or print-based annotations when it came time for in-class discussion. This particular finding indicates the overall challenge of simultaneously developing open, digital literacies and practices alongside traditional, print-based reading skills. As Blyth (2014) indicates, developing methods to get learners to merge these two skill sets together should be the goal for language instructors who opt to incorporate these kinds of practices.

Research Question 3

What are the primary benefits and challenges of incorporating collaborative reading in a university-level Spanish poetry course via a DAT from an instructor perspective?

Upon completion of the study we interviewed John, the professor of the Spanish poetry course, to further understand the possible benefits and challenges of integrating a DAT into an upper-level, face-to-face, foreign language literature course. Although John admitted a personal aversion to reading digital texts, he revealed several benefits of using Hylighter in his class. The benefits can be broadly characterized into three subcategories: social benefits, pedagogical benefits, and performance benefits.

In terms of social benefits, John mentioned on numerous occasions how the tool "established a sense of community." He was particularly impressed with the "companionship and kindness" that he saw in many of the comments, to which he later reflected on by saying, "it was just really neat for me to see that and that just doesn't happen much in class, you don't get that in class." In addition to developing a sense of community, John also explained that, "there were a few of those students that didn't comment much in class . . . [but they] really just seemed to come alive on Hylighter." John's comments suggest that from a social perspective, some of the students opened up or participated more when provided the opportunity to discuss the poem with classmates in a digital environment.

As for the pedagogical benefits, John discussed how Hylighter helped him to better understand his students. He pointed out that it helped him "identify the fact that student X, Y, and Z actually read and actually had really great ideas even though they hadn't been sharing them all semester." Interestingly, this realization led to some self-reflection on teaching methods, "it made me wonder how can I help them participate like this in class because they obviously can do it." Finally, John also stated that using Hylighter helped him lead discussions in class because he was able to note areas of the poem in which a question was asked but no answer was given.

John also mentioned a few ways in which Hylighter increased student performance levels both in and out of the classroom. First, he pointed out that students' comments in Hylighter tended to be better than those that were made in class. He believed this was because commenting in the digital space allowed for more time and thus a "contemplated reaction, rather than just a reaction." He later expanded on this idea when he stated, "when you're writing, you stick by words." John also stressed that making comments every week

via Hylighter made students more accountable for their homework.

Even though a majority of John's comments demonstrated the positive effects of Hylighter, he did offer a few drawbacks. First, John indicated that he wanted his students to bring a copy of the text and their notes to class for discussion. However, this was somewhat problematic when the texts and notes were stored on Hylighter. On a related note, John asked the researchers to print off and make copies of students' comments made in Hylighter. Copies of students' annotations and other students' replies were then distributed at the beginning of the class and were used to facilitate in-class discussion. Finally, John commented on the technical drawbacks of the Hylighter tool itself and explained that it felt "kind of wonky" and that it was not always user-friendly.

Conclusions and Implications

The findings of this study serve to not only advance the ecological theoretical perspective of L2 learning via the operationalization of the affordance construct in the context of digital collaborative reading, but they also have shed light on some of the potential benefits and challenges for learners and instructors when using DATs in an L2 context. We have seen that engaging in collaborative reading can allow learners to carry out a closer reading of literary texts while also leading to the creation of a more open and social learning community among learners and their instructor. While creating and maintaining an open L2 reading space for learners did have its drawbacks for students in this small-scale, exploratory study, collaboratively reading and interacting with digital texts outside of the physical classroom did result in the instructor being better able to see which parts of the poems needed clarification during in-class meetings. DATs therefore are able to not only affect how learners engage with digital texts outside of class, but also potentially impact how instructors and students discuss the texts via whole-class discussions. A future research project therefore might seek to better understand how students' collaborative reading and annotating affects in-class discussion among students and their teacher, which, in turn, could enhance learners' comprehension of the texts and potentially facilitate acquisition of the L2.

As previously mentioned, one of the pedagogical challenges that remains is how to systematically provide opportunities for learners to develop their digital literacies alongside the traditional skill-oriented development goals found in many L2 language learning courses. As the foreign language profession begins to embrace a multiliteracies-based pedagogy (Cope & Kalantzis, 2009; Paesani, Allen, & Dupuy, 2016), an approach that emphasizes the "interdependence among speaking, listening, reading, and writing skills and focus[es] students' attention on the interactions between linguistic form, situational context, and communicative and expressive functions" (Kern, 2003, p. 51), it will be important to demonstrate not only how and why digital literacy development is necessary for L2 learners in a more globalized, technologically mediated world, but also ultimately how digital literacy might affect L2 acquisition.

Another pedagogical challenge related to L2 collaborative reading identified in our study relates to the fact that instructors should carefully think about how to effectively structure annotating tasks within DATs. As determined by the focal student interview data, being required to make an original comment on a short text (e.g., a poem) after the majority of students in the class has already commented or annotated the text can lead to unnecessary pressure or anxiety to contribute something meaningful and avoid being viewed as a lazy student. Related to this potential problem is the other issue identified in this study of some students being (negatively) influenced by other students' comments and annotations. We recommend that future work on DATs should take this into consideration by either (a) assigning students to comment on different sections of the same poem to mitigate the pressure of making original comments, or (b) choosing a DAT that has a built-in feature that first allows students to read and annotate the digital text on their own before then being able to see other students' comments at a later date. These kinds of pedagogical decisions will be key to improving students' digital social reading experiences.

From a theoretical standpoint, the affordance construct is one that has been and continues to be attractive to researchers who make use of socially based theoretical frameworks for their work. However, only a few

studies in the computer-assisted language learning (CALL) literature have operationalized the affordance construct in digital environments. This study fills this theoretical void with an aim to provide future CALL researchers with a working definition of the affordance construct in order to carry out more empirically based research that employs an ecological perspective on L2 learning and teaching. The literary, social, and linguistic affordances identified in this study may very well lead to students becoming closer readers of L2 texts which, in turn, could facilitate L2 acquisition. What is clear is that much more empirical work is needed to improve our understanding of the ways in which learners interact with literary text, with each other, and with their instructor by engaging in L2 collaborative reading via DATs. This study has contributed something to that endeavor.

Finally, it is important to note the limitations of this study. As previously mentioned, the version of the Hylighter tool used in this project limited what participants and the researchers could do with this particular DAT. From a research perspective, using a DAT that provides more detailed tracking of how each user engages with the text (i.e., via more detailed log files) is an important detail for future empirical work in this area (Fischer, 2007). That is, having access to a more robust user log file system would provide instructors and researchers alike with a fuller understanding of how students make use of the various features of DATs when engaged in social reading.

Another limitation involves the fact that we did not consider the difficulty level of the reading nor did we formally assess each student's overall proficiency in Spanish. These two variables would be helpful to gain a better understanding of how different kinds of students (e.g., more-proficient vs. less-proficient learners) interact with digital texts via the DAT. In addition, having a better understanding of the reading difficulty level of each text and comparing that to the quantity of the three different kinds of affordances identified in this study, would have provided more information as to whether or not more challenging poems lead to an increase in literary or linguistic affordances. Future work should indeed investigate the relationship between these two points of data.

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Notes

1. When collecting data for this study, we used the most recent version of Hylighter available. At the time of writing this manuscript, we learned that Hylighter had announced an updated version of its software. As such, some of the technical issues encountered by some students along with the limited log file options and features may have been addressed in the newer version of the tool.
2. As pointed out by an anonymous reviewer, the difficulty level of a text can be an important factor to consider when investigating L2 reading comprehension issues as pointed out by Bernhardt (2010). We realize that this is a limitation of our study in that it would have been better to perhaps provide a balance of the difficulty levels of the poems across the 4-week data collection period. However, we were partly constrained by the course syllabus and the poems that the instructor was planning to cover during that time period in the course. Analyzing the difficulty level of the poems and comparing those levels to the amount and kinds of affordances that result is something that we intend to pursue in a future study.
3. One student did not submit annotations for any of the poems during the course of our study. The instructor indicated that he also missed several class meetings and therefore did not reflect typical student behavior for this class.

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Appendix A. Sample Mini-Analysis Task

NOTE: The following mini-analysis was written entirely in Spanish for the students. For the purposes of this article (and when appropriate), we have translated it to English.

Homework for April 15

Lorca y los *Sonetos del amor oscuro*



Readings:

- Georges Bataille, *Erotism*, selección (in course pack)
- Federico García Lorca, *Sonetos del amor oscuro*
 - “Soneto de la dulce queja” (in HyLighter)
 - “Llagas de amor” (in HyLighter)
 - “El poeta dice la verdad” (in HyLighter)
 - “Ay voz secreta del amor oscuro” (in HyLighter)
 - “Noche del amor insomne” (in HyLighter)

Read the above texts and answer the questions below. Lorca’s *Sonetos* should be read via HyLighter. You will not have to do a mini-analysis, but your comments made in HyLighter will be graded. Remember that you must make 1 highlight/comment on each poem before midnight on Saturday and then make another comment (per poem) on someone else’s comment by midnight on Tuesday.

1. Look for information online about the background of Lorca’s *Sonetos del amor oscuro*. For example, when were the *Sonetos* published?
2. What are some of the dominant themes in the *Sonetos*? Make a list and find quotes in the poems to provide evidence for your ideas.
3. Choose various metaphors/images in the poems and interpret them.
4. Comment on the title of the collection. Identify three possible interpretations of the title.
5. In what sense can we classify these poems as surrealist poems?

Appendix B. Coding categories and resulting/corresponding affordance types

1. Literary affordances
 - a. comments/annotations regarding rhetorical devices
 - b. comments/annotations regarding an interpretation
 - c. comments/annotations regarding an expansion of someone's idea(s) or interpretation(s)

2. Linguistic affordances
 - a. comments/annotations regarding grammar
 - b. comments/annotations regarding vocabulary/lexical issues

3. Social affordances
 - a. comments/annotations regarding an expression of 'like'
 - b. comments/annotations regarding an expression of 'dislike'
 - c. comments/annotations regarding an expression of an opinion
 - d. comments/annotations regarding an expression of a personal reference
 - e. comments/annotations regarding an expression agreement
 - f. comments/annotations regarding an expression of disagreement
 - g. comments/annotations regarding a compliment
 - h. comments/annotations regarding an off-topic comment

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