
The Smartphone as a Personal Cognitive Artifact Supporting Participation in Interaction

LAURA E. EILOLA¹  AND NIINA S. LILJA²

¹Tampere University, Faculty of Information Technology and Communication Science, Kanslerinrinne 1, Tampere, 33114 Finland Email: laura.eilola@tuni.fi

²Tampere University, Faculty of Information Technology and Communication Science, Kanslerinrinne 1, Tampere, 33114 Finland Email: niina.lilja@tuni.fi

This article uses multimodal conversation analysis to investigate how the smartphone as a personal cognitive artifact features in second language (L2) use and learning. The data come from a pedagogical intervention that was organized as part of an integration learning course for adult L2 students with emerging literacy. The purpose of the intervention was to guide the students to participate in everyday interactions outside the language classroom and to learn from them. The analysis concentrates on a focal student's smartphone use during different phases of the intervention and offers a detailed account of how the smartphone provides affordances for the student to formulate recognizable social actions and participate in different phases of the pedagogical activity. The analysis adds to our current understanding of the role of mobile technology in L2 learning and illustrates how experiential pedagogy supports language learning as social activity. The findings can be used in designing pedagogical practices that support L2 students to develop their interactional competences on the basis of their own needs and goals.

Keywords: smartphone; multimodality; learning in interaction; conversation analysis; second language; adult L2 learners; cognitive artifact

SMARTPHONES ARE UBIQUITOUS IN today's society. They affect human sociality in many ways and serve new forms of participation by altering the ways people access knowledge and engage in different interactions at the same time (Raclaw, Robles, & DiDomenico, 2016; Sahlström, Tanner, & Olin-Scheller, 2019). Smartphones and screen-mediated sociality more generally are

also affecting pedagogical spaces. Smartphones enable access to interactions and information beyond the classroom, and language learners use technology in innovative and often unexpected ways (see Dooly, 2018). However, even if there is evidence of the positive effects that technology may have on language use and learning (see Thomas et al., 2013), our understanding of how smartphones and other mobile devices are used in everyday co-present interactions and of how technology-mediated learning processes unfold remains limited.

This article adopts a multimodal conversation analytical perspective to analyze how a second language (L2) and literacy learner of Finnish uses their smartphone as a cognitive artifact that supports their participation in interactions in the language classroom and beyond; that is, 'in-the-wild' (see Wagner, 2015, 2019). We use the term *cognitive artifact* to refer to smartphones as man-made objects that support users by providing affordances for formulating social actions,

The Modern Language Journal, 105, 1, (2021)

DOI: 10.1111/modl.12697

0026-7902/21/294-316 \$1.50/0

© 2021 The Authors. *The Modern Language Journal* published by Wiley Periodicals LLC on behalf of National Federation of Modern Language Teachers Associations, Inc.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

remembering, and learning (Norman, 1991). Our analysis illustrates how the affordances of the smartphone support the focal participant in formulating social actions in interactions in the classroom and everyday contexts. The analysis also shows how the smartphone figures in a learning project the focal participant carries out across different encounters.

The data for the analysis come from an ethnographic project with a group of adult L2 learners with emerging literacy and comprise a set of video recordings from a pedagogical intervention that was organized as part of integration training courses for newcomers.¹ The pedagogical intervention aimed at developing ways of bridging the language-use environments in the classroom and everyday encounters that are relevant in adult migrants' life-worlds. It also aimed to support the L2 learners in finding ways to participate in different interactions in their everyday lives, using the language of their new home country, and seeing how these interactions could work as language-learning opportunities. The intervention consisted of three phases: preparing for a service encounter in the marketplace, participating in that interaction and video recording it, and then reflecting on it in retrospective discussions back in the classroom.

The number of adult L2 learners with emerging literacy is vast: It is estimated that there are 773 million adults with emerging literacy in the world today (UNESCO Institute for Statistics, 2020). Many of these individuals live in conflict areas and are therefore forced to migrate to other countries. In their new home countries, they face the need to acquire a new language and engage in new kinds of literacy practices at the same time. Studies investigating how these individuals navigate the complex demands of various interactions in classrooms and beyond in their L2 are only beginning to emerge (Bigelow & King, 2014; Bigelow et al., 2017; Gonzalves, 2020; Hellermann, 2018a, 2018b; Hellermann & Harris, 2015; King, Bigelow, & Hirsi, 2017; Pettitt, 2017). The few existing studies analyzing the use of technology by adult L2 learners with emerging literacy has indicated the omnipresence and importance of mobile phones for their literacy practices (see Artamonova & Androutsopoulos, 2020; Pettitt, 2017). This article aims to contribute to this emerging area of research by providing understanding of how the situated use of smartphones augments the resources available for social action and supports adult L2 learners, enabling them to participate in interactions and learn from them. We see the focal learner's smartphone use in our data as an example of the sophisti-

cated digital literacy practices that are part of their linguistic repertoire (see Rowsell et al., 2013).

- RQ1. How does the L2 learner with emergent literacy use their smartphone as a cognitive artifact in pedagogical interactions?
- RQ2. How do smartphones as cognitive artifacts augment the resources available for social action, enabling L2 learners to participate in interactions and to learn from them?

Our analysis is based on the understanding of human cognition as distributed and extended (Clark & Chalmers, 1998; Hutchins, 1995). By analyzing how the focal learner participates in interaction and uses his smartphone in formulating social actions, we aim to show what the ideas of distributed and extended cognition mean at the very practical level of face-to-face interaction. We argue that the appropriate use of personal cognitive artifacts can be seen as part of interactional competence, that is, the "*ability for joint action* [emphasis in original] that is contingent upon the details of social interaction people participate in" (Pekarek Doehler, 2019, p. 30). Interactional competence is thus not an individual phenomenon but emerges in interaction between participants and is situated and context bound. Our analysis adds to this understanding by providing new perspectives on how the environment and its materials, such as smartphones as personal cognitive artifacts, may figure in formulating joint action. These new perspectives have pedagogical implications, as they highlight the importance of equipping L2 learners with methods for producing joint social action not only with the help of other people, but also with the support of the environment and artifacts that are always there, such as smartphones.

THE USE OF TECHNOLOGY IN INTERACTION AND LANGUAGE LEARNING

Previous studies on smartphone use in social interaction have analyzed how the affordances provided by smartphones structure social interaction (DiDomenico & Boase, 2013; Raclaw et al., 2016; Raudaskoski, 2009). Mobile devices are wireless and easy to carry, and therefore they make it possible to seek and share information whenever needed (see, e.g., Raclaw et al., 2016). However, since phones are personal devices, participants do not usually have equal access to them in face-to-face interaction and this may shape the participation frameworks (Thorne et al., 2015).

Smartphones also make it possible to include participants who are not physically present in the situation and to take part in many simultaneously ongoing interactions (Dooly, 2018; Sahlström et al., 2019).

In the analysis to follow, we will showcase the use of a smartphone as a personal cognitive artifact. The notion of ‘cognitive artifact’ stems from the work of Norman (1991) and refers to man-made objects that mediate our reasoning and understanding. Examples of cognitive artifacts embedded in our everyday life include road signs or way-finding signage in public buildings and personal objects such as grocery lists. The notion of cognitive artifacts implies the idea that the material environment is important in human cognitive processing. The same idea is constitutive of a cluster of recent theories in cognitive sciences and the philosophy of mind. This bundle of theories is often referred to as the theory of 4E cognition—that is, cognition as embodied, enacted, embedded, and extended (see Clark & Chalmers, 1998; Telakivi, 2020). The 4E theory challenges the idea of cognition as brain bounded and instead sees cognition as fundamentally embodied, situated, and socially shared. Cognition is ‘embodied’ as our body both enables and shapes our perceptions of the world, and it is ‘enacted’ through our actions in the environment (see Varela et al., 1991). The idea of cognition as ‘embedded’ in social contexts comes close to the notion of distributed cognition (Hutchins, 1995). In a seminal study, Hutchins (1995) analyzed how the processes of problem solving were collectively organized and accomplished in the complex material environment of a U.S. Navy ship. He emphasized the idea that our cognitive capacities are not individual but are rather embedded in social practice, in interactions between people and material and physical contexts (see also Hellermann et al., 2019).

The most radical part of the 4E theory is the thesis of cognition as ‘extended.’ In their well-known essay “The extended mind,” Clark and Chalmers (1998) argued that the environment (including artifacts) should not be seen merely as an aid in human cognitive processes but as a central part of them. This view is radical because it encompasses all the other parts of the 4E theory and argues most clearly for the role of the environment as a constitutive part of cognitive processes. In line with this view, cognitive artifacts, such as smartphones, could be seen as ‘extensions of individuals’ (see Clark & Chalmers, 1998; Telakivi, 2020).

The 4E theory of cognition has influenced conversation analysis in L2 acquisition research (CA-SLA) in recent years, and it has important theoretical and methodological consequences (see Eskildsen & Markee, 2018). First, it invites us to rethink the cognitive processes related to language learning. If cognition is understood to be distributed among people, environments, and artifacts, then language use and learning should also be regarded as a social and shared process and analyzed as such. Second, if cognitive processes are embedded in social practice and enacted in interaction, they should also be (at least partly) observable in how people act together and how they use the artifacts that are relevant for their meaning making (see also Hellermann, 2018a).

In this article, we analyze the use of the smartphone as a personal cognitive artifact with the methods of multimodal CA, which allow us to scrutinize how the focal participant, Ali, orients to using his phone during the different phases of a language-learning task. He first notices a phrase in the classroom interaction and treats it as a ‘learnable’ (see Majlesi, 2018; Majlesi & Broth, 2012) by repeating it, translating it from Finnish into Arabic with the help of the Google voice recognition application on his phone, and saving the result on his phone as a picture. This makes it possible for him to use the phrase again in subsequent interactions. As a personal cognitive artifact, the smartphone thus provides the focal participant with resources for remembering and using the language he is learning. In this use, the phone is an artifact rather similar to a notebook but with affordances that also extend Ali’s cognitive abilities with applications that make it possible for him to process the learnable in many languages—that is, in both Arabic and Finnish (see also Bigelow et al., 2017; Pettitt, 2017)—and to remember it later. The detailed multimodal analysis of Ali’s contributions to interaction inside and outside the classroom makes it possible to observe how he makes use of the smartphone as a personal artifact and how this allows him to use his emerging L2 in meaningful and relevant ways (see also Pekarek Doehler & Pochon-Berger, 2015).

Our analysis is also motivated by the observation that to date, relatively little is known about how L2 learners with emerging literacy use their smartphones or how the use of mobile technology may possibly support their L2 use and learning. Some observations have been made, however. In a recent study, Artamonova &

Androutopoulos (2020) followed the smartphone use and language practices of groups of refugees in Germany. The participants were heterogeneous and included L2 literacy learners. The analysis illustrates that to some extent the phone's affordances steer the digital literacy practices the participants engage in. The affordances are the possibilities and constraints delimiting the use of an object (Hutchby, 2001). In the case of a smartphone, these are both material and functional. On the one hand, the affordances are connected to the phone's physical characteristics, such as the size of the screen and keyboard. On the other, the possible uses of the phone are also defined by the applications downloaded on it. The touch screens and flexible keyboards of smartphones have been identified as affordances that facilitate the use of smartphones by users with emergent literacy (Artamonova & Androutopoulos, 2020; Smyser, 2019). Pettitt (2017) has also shown that in a classroom context, the pictorial and video resources as well as the spoken-language applications of the smartphone were central for L2 students with emerging literacy. The participants in the study used their mobile devices for both academic and nonacademic purposes. They took photos of class texts and shared pictures and videos to accomplish tasks and tell stories. Our analysis adds to this accumulating line of research and shows that the voice recognition features of the phone are relevant for L2 users with emerging literacy.

THE STUDY

Data and Participants

The data for the research presented in this article come from a video-ethnographic project with adult L2 literacy students in Finland who took part in integration training language courses. The group of participants consisted of 16 students, and the fieldwork with them lasted for 8 months, during which the group's language classes were regularly video recorded. Most of the students were originally from Iraq and Syria, and they had migrated to Finland either as asylum seekers or refugees. The linguistic and literacy resources of the participants had been tested before the language classes, and on the basis of the tests they were identified as literacy learners, that is, learners who need support in acquiring literacy practices relevant to their new home country. The Latin alphabet was new to them all and they had no or interrupted history of formal schooling in their home countries.

The ethnographic fieldwork involved regular participant observation in the classroom (by the first author) and cooperation with the teachers of the classes. The focal dataset comes from a pedagogical intervention that took place toward the end of the training and 8-month fieldwork period. By this time, all participants had acquired some Finnish, and soon after the pedagogical intervention, the participants were all tested and assessed as having achieved the overall language proficiency level of A1 in the Common European Framework of Reference for Languages (Council of Europe, 2001). The individual proficiency profiles varied, however, and some still struggled even with mechanical reading and writing skills.

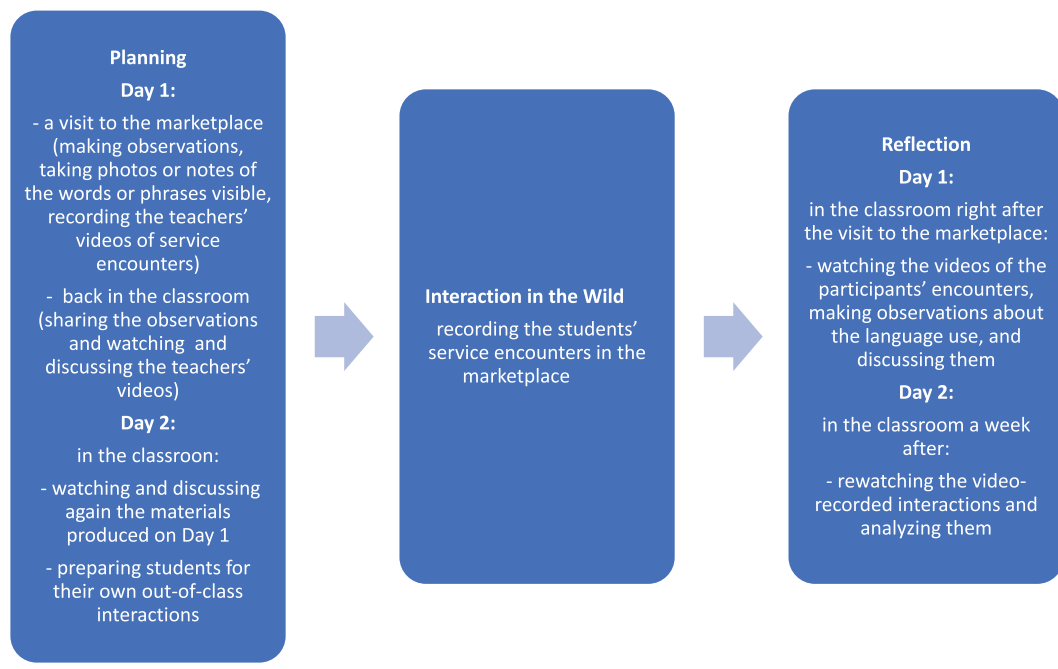
The pedagogical intervention was based on the ideas of experiential learning that highlight the learner's active role and the importance of reflection for learning (Hall, 2019; Knutson, 2003).² It was motivated by the observation that for newcomers to Finland—and in particular, those with asylum seeker or refugee backgrounds—it is very challenging to find opportunities to use Finnish outside language classrooms and to create social networks with locals (see Lilja, 2018). The intervention was designed as a three-phase project that involved a visit to a marketplace. During the intervention, the first author was teaching the students together with a teacher from the language education institution in which the ethnographic fieldwork and pedagogical intervention took place. This departed from the group's routines, since the researcher did not normally teach the class. However, the participants were used to her presence in the classroom and regularly sought her assistance in their learning.

The intervention started with a visit to a marketplace where the teachers guided the students to make observations about the language they saw and heard. The students were also asked to take photos and make notes of words and phrases visible on different signs. The teachers video recorded their own service encounters at a fruit stall. Back in the classroom, the observations were shared, and the teachers' videos were watched and discussed by the whole group to prepare the students for their own similar interactions. The students were also instructed to think about questions they would like to ask during the next visit to the marketplace.

The second phase of the intervention again took place in the marketplace where the students engaged in service encounters that were

FIGURE 1

Phases of the Intervention [Color figure can be viewed at wileyonlinelibrary.com]



video recorded by the teachers. The third phase, reflection, took place back in the classroom. It was carried out on two different occasions: right after the students' visit to the marketplace on the same day, and again 1 week after the visit. Both times, the videos of the participants' real-life encounters were watched by the whole group, and the students were encouraged to make observations about the language use in the interactions in a whole-class conversation. Figure 1 illustrates the different phases of the intervention.

In the analysis to follow, we will concentrate on the interactions of the focal student, Ali. He had moved to Finland from Syria and had some interrupted history of formal schooling there. By the time of the pedagogical intervention, he had developed basic reading and writing skills in both Finnish and Arabic (his overall proficiency level in Finnish being A1). According to our observations, he is an active student who engages in different literacy practices enthusiastically. This is also observable in the excerpts in the analysis to follow. We selected Ali to be the focal student in the analysis because we observed that he used his smartphone throughout the pedagogical experiment and was very successful in his participation

in different interactions. His smartphone use for language-learning purposes was exceptional in the focal group. Our interest in smartphone use as a cognitive artifact was data driven (on the methodological principles of conversation analytical methodology, see, e.g., Sidnell, 2010).

Ethical Issues

Ethical issues merit much consideration when doing research with participants who may be vulnerable. It is important to be sensitive in all choices made in the research setting (see Bigelow & Tarone, 2004). The same applies to video-ethnographic research more generally (Aarsand & Forsberg, 2009). We began the ethnographic fieldwork with a researcher being present in the classroom and making the acquaintance of the participants. After a couple of weeks of observation, the possibility of video recording was discussed. Easy Finnish and interpreters were utilized to explain the idea of the study at this point. All but three students gave their consent for video recordings, although the three who did not want to be video recorded gave their consent for audio recording. A decision was made to place the

cameras so that they did not capture the embodied actions of the participants who had not given permission for video recording. Orally requested consent was documented either by video or audio recording, depending on the form of permission the participant provided. The research and video recording were discussed again many times during the fieldwork, and the students had opportunities for discussion with the researcher whenever they wanted because the researcher was present in the classroom regularly. All the clerks involved in the service encounters in the marketplace were informed in advance about the purpose of the study, and they all gave consent for the video recordings.

Methods of Analysis

Our main method of analysis is multimodal CA, which provides us with the analytical tools to pay attention not only to language but also to gestures, gaze, body postures, movement, and the manipulation of objects, and to consider them in relation to the material ecologies of the analyzed interactions (see Mondada, 2018, 2019). Conversation analytical research is concerned with the members' competencies that underlie ordinary social activities. In other words, the interest is in discovering how participants design their social actions to be recognizable and accepted by others (Pekarek Doehler & Pochon-Berger, 2015).

The multimodal transcription conventions developed by Mondada (2018; n.d.) have been used in transcribing the data (see the Appendix). These conventions are based on the conversation analytical transcription system developed by Jefferson (2004), but in them, the participants' embodied actions are also annotated. The base line of the transcript shows the temporal unfolding of verbal actions and the embodied actions are annotated in relation to that (Mondada, n.d.). Screen captures from the videos illustrate the use of relevant multimodal resources, especially the focal participants' orientation to their smartphone. A gloss line is added in between the original line and translation when relevant. The video-ethnographic information about the participants has informed the analysis, but it is not used as evidence that would somehow confirm the observations (see the discussions in Waring et al., 2012, and in Maynard, 2003). Rather, the ethnographic process has helped us in designing the pedagogical experiment from which the dataset originates and, in some cases, in getting the

participants' own perspectives on what they are doing.

USING THE SMARTPHONE AS A COGNITIVE ARTIFACT IN INTERACTION

In the following analysis, we show how the focal student, Ali, uses his smartphone as a cognitive artifact in the different phases of the pedagogical activity. We begin the analysis by showing how Ali poses a question about the opening hours at an ice cream stand and relies on his phone to formulate the question (Excerpts 1a and 1b). We focus on the question about the opening hours because, in the analysis, we noticed that Ali used his smartphone as a resource that supported him in posing the question. We then started to trace how he prepared to ask this question in the classroom prior to the visit to the marketplace and how he then again talked about the question in retrospective discussions. We noticed that the phone figures as a relevant artifact in all of these interactions. For these reasons, we then decided to scrutinize Ali's use of his smartphone in detail.

We begin the analysis with an excerpt from Ali's video-recorded interaction in the marketplace. While this interaction is not chronologically the first one in which Ali orients to his phone to learn the phrase about the opening hours, we begin the analysis with this excerpt as it was particularly this out-of-class interaction when we first observed Ali's smartphone use for language-learning purposes. We will then show how Ali has prepared for this question in the classroom (Excerpt 2) and how the question is again discussed during the reflection phase of the pedagogical intervention (Excerpts 3–5). The analysis illustrates how the trajectory of learning a particular way of asking about opening hours evolves from noticing the focal phrase through using it with the support of the smartphone, to reflecting on it and making connections to other similar kinds of ways of phrasing the same question.

Interaction in the Marketplace

Excerpt 1 illustrates how Ali orients to his phone while formulating the question about the opening hours of the ice cream stand in the marketplace. Prior to posing the focal question (Excerpt 1b, 70), Ali had already placed his order: He had ordered one scoop of chocolate ice cream. Excerpt 1a shows how Ali orients toward his smartphone while the clerk prepares the ice cream for him.

EXCERPT 1a

Ali's gaze *

Ali's embodied conduct +

Clerk's embodied conduct ^

48 CLE **haluutko** ***voh:veli**in vai ***kuppiih**
 do you want it in a cone or in a tub
 ali *gaze toward the cone*gaze twd the tub->

49 ALI ***°ha+luan°**#
 I want
 ->*gazes twd the cone->
 +points to the cone->
 fig #fig.2



FIGURE 2

50 +**^(.)** ^

ali ->+
 cle ^nods^

51 CLE **^joo h^**
 yeah h
 ^nods ^

52 **^(1.0)**

cle ^puts the tub away and takes the ice cream scoop in RH->

53 **^*+ #(~13)** **+ (~7.0)^**

cle ^takes the cone in LF, turns to the left, walks (away from video)

ali *gaze to mobile phone->

+browses the phone +stops browsing

cle ^walks back to counter with ice cream in hand->

fig #fig.3



FIGURE 3

54 CLE **^†nä:in** †**ole** **hyvä^**
 like this here you are
 ^hands the IC toward Ali
 and places it on the counter^

In Excerpt 1a, the clerk inquires whether Ali wants the ice cream in a cone or a tub (48). Ali points toward the cone saying *haluan* 'I want' (49, Figure 2), and the clerk acknowledges the answer (51), takes the cone in her hand, and walks toward the freezers behind her to prepare the ice cream (53). At this point, Ali turns his gaze toward his phone, which he is holding in his left hand, and starts to browse the phone with his right index finger (53, Figure 3). He continues to browse the phone for about 13 seconds and then stops and

looks at the screen. He turns his gaze toward the clerk as she comes back and places the ice cream on the counter (54).

After having placed the ice cream on the counter, the clerk announces the price. Ali puts his phone on the counter, takes money from his pockets and hands it to the clerk (this payment sequence is omitted from the transcript to save space). Excerpt 1b begins with the clerk thanking him for the payment (66). The excerpt illustrates how Ali gazes toward his

EXCERPT 1b

- 66 CLE **kiitos paljo^**
thanks a lot
 ^turns to her left, walks->
- 67 ALI **°kiitos:°**
thank you
- 68 (0.6) **+#(.)* # (~3.0)**
 ali +takes the phone from the counter
 *gazes at the screen of the phone->
 fig #fig.4#fig.5



- 69 CLE **^°noin euro takasin oleh hyvä^°=**
like that one euro back here you are
 ^gives the change to ALI ^
- 70 ALI **=mihin aikaan *+on auki**
what.ILL time.ILL be.3SG open
what time is open
 *gazes toward the ice cream menu->
 +points to the menu with RH->
- 71 ***(0.6)**
 ali ->*gaze twd CLE->
- 72 CLE **^anteeks?=
 pardon**
 ^gaze to ALI, leans fwd (until the end of excerpt)
- 73 ALI **=mihin aikaa on: (.) <auki>**
what.ILL time.ILL be.3SG open
what time is (.) open
- 74 (.)
- 75 CLE **yhdeksään asti (.) ^[illalla] ^**
until nine (.) in the evening
 ^nods twice^
- 76 ALI [(-)]
- 77 ALI **+illalla?**
in the evening
 +lifts eyebrows
- 78 CLE **joo?**
yeah

smartphone before asking the focal question (68–70).

When Ali has handed the payment to the clerk, the clerk turns left and walks to the cash regis-

ter (66). At the same time, Ali takes the phone from the counter and starts looking at the screen again (68, Figures 4 and 5). This time, he does not browse the phone, however. As the clerk comes

back and hands the change to Ali (69), he poses the focal question (70). Ali thus asks the focal question sequentially right after the clerk has handed him the change. The expected action at this point would have been to thank the clerk for the change, as the clerk's offering of the change is recognizable as the first action (see Koivisto, 2009). In place of the 'thank-you' turn, however, Ali poses the question about the opening hours. The question is latched on to the clerk's verbal turn. For these reasons, the question appears rather unexpected in this sequential context. This is also evidenced in the clerk's reaction: She produces an open-class repair initiator and leans forward toward Ali (72). Open-class other initiations of repair occur regularly after sequentially unexpected turns (see, e.g., Drew, 1997). Next, Ali repeats the focal question in a slower tempo (73), after which the clerk produces an answer (75).

In terms of its grammatical structure, Ali's question is missing a subject. However, his pointing gesture toward the ice cream menu and the overall context of the interaction make it quite clear that he is talking about the opening hours of the ice cream stand. In her answer, the clerk announces the closing time: The stand is open until "nine [o'clock] in the evening." Ali acknowledges the answer by repeating the adverbial *illalla* 'in the evening', after which the interaction moves toward its closing.

In Excerpts 1a and 1b, Ali thus orients to his phone twice. He first browses the phone and looks at its screen while the clerk prepares the ice cream (Excerpt 1a, 53) and then again just before posing the focal question (Excerpt 1b, 68). It is important to note that Ali only orients to the phone while the clerk is busy with something else and not while he is actually interacting with her.

FIGURE 6
Ali's Smartphone Screen



The timing of Ali's question in the place of a thank-you turn made us as analysts think that he is reading the question from the smartphone screen. However, the screen of Ali's phone is not observable in the video recording. Therefore, we contacted Ali after the pedagogical intervention, showed him the video, and asked him to explain what he is doing with his phone. In line with our analysis, he reported that before this interaction, in the classroom, he had uttered the phrase to his phone in Finnish, used the Google Translate application to receive both an audio and written Arabic translation, and saved the phrase on his phone as a screen capture (see Figure 6). He also reported that in this interaction, he first searched for the question on his phone and then read it from the screen before asking it. Next, we will

show how Ali noticed the focal phrase in classroom interaction and saved it on his phone for future use.

Preparing for the Marketplace Interaction

The pedagogical intervention began with the group visiting the marketplace and taking photos of the language observable. Ali had taken a photo of the coffee stand opening hours sign (see Figure 7). One of the teachers had also asked about the opening hours of this stand in her video-recorded interaction. The same interaction was watched in the classroom by the whole group as the students prepared for their own interactions in the marketplace.

FIGURE 7
Ali's Photo Showing Opening Hours of Coffee Stand



Excerpt 2 comes from a whole-class discussion in which Ali's photo of the opening hours is looked at together. Prior to the excerpt, the concept of 'working days' has been discussed, since the opening hours of working days differ

from those of Saturday and Sunday, according to the sign. In Excerpt 2, this discussion continues. The excerpt illustrates how Ali notices the focal question (45) and repeats it to his smartphone and to the Google Translate application (54).

EXCERPT 2

Ali's gaze *

Ali's embodied conduct +

- 29 TEA1 **mi-mitä? mi;tä voit kysyä.**
wh-what what can you ask
- 30 (1.3)
- 31 TEA1 **jos et tiedä:? (.) mikä ke- (.) mitä kysyt.**
if you don't know (.) what (.) what do you ask
- ((5 lines omitted))
- 38 TEA2 **mitä TEA1 kysyi eilen,**
what TEA1 asked yesterday
- 39 JAM **mitä: auki::**
what open
- 40 TEA2 **kun osti kahvia ja mun[kkia,]**
as (she) bought coffee and doughnuts
- 41 JAM [mitä], mitä auki:
what.PAR what.PAR open
what what open
- 42 TEA1 **↑joo (.) mi- mihin <aikaan>**
what.ILL time.ILL
yeah (.) wh- what time
- 43 JAM **mi-[ai(k)aa]**
wh- time
- 44 TEA1 **[on auki.] (.) mihin aikaan on auki.**
be.3SG open what.ILL time.ILL be.3SG open
is open (.) what time is open
- 45 ALI **mihin aikaan on auki.**
what.ILL time.ILL be.3SG open
what time is open
- 46 TEA1 **mihin aikaan on auki.**
what.ILL time.ILL be.3SG open
what time is open
- 47 TEA1 ***↑joo, (.) hyvä?+**
yeah good
 ali *gazes toward his smartphone-> (55)
 +leans forward to the smartphone-> (55)
- 48 (0.5)
- 49 TEA1 **hyvä hyvä,**
good good
- 50 (1.0)
- 51 TEA1 **no, siinä oli (nyt niitä) jäätelöitä**
well, there were (those) ice cream portions (now)
- 52 (0.5)
- 53 TEA1 **<kukkia?>**
flowers
- 54 ALI **mihin aikaan on auki.**
what.ILL time.ILL be.3SG open
what time is open ((talking to his phone))
- 55 TEA1 **mihin aikaan on auki. (.) joo.**
what.ILL time.ILL be.3SG open PRT
what time is open (.) yeah

The teacher invites the students to think about how to ask about the opening hours (29–31). The students provide partial answers (in omitted lines 32–37) and the co-teacher guides them to recall how that question was asked in the video they had just watched (38, 40). After a response by a student, Jamal (39, 41), the teacher articulates the question herself (42, 44) and thus provides the students with a model for formulating the question.

As soon as the teacher has provided the model, Ali repeats it (45). His actions after this repetition are relevant for our analysis: He leans forward toward his smartphone (47 onwards) and repeats the phrase, speaking to his phone (54). According to his own report, the application provides the Arabic translation of the phrase (both in spoken and written form) and he regularly takes screenshots of the results and saves them on his phone for later use. Even though this action is not observable in the video, according to his own report, he also did it here and the result of this activity is evidenced in Figure 6. The teacher hears Ali's repetition and acknowledges it by repeating the phrase once again (55).

It has long been argued that in order to learn, learners must consciously pay attention and notice the language relevant for their learning process (see Schmidt, 2012). In L2 acquisition research, attention and noticing have been mostly analyzed as individual phenomena—that is, as something that happens privately. More recently, however, CA-SLA studies have also illustrated how noticings can be co-constructed as bodily actions (Kääntä, 2014) and how noticings in everyday interactions usually involve repetition of the noticed language items and lead to further talk about language use (Greer, 2019). In Excerpt 2, the process of noticing is interactional from the start as the teacher calls for the students' attention and the students in turn actively respond to her call. Ali's orientation to the relevance of the focal phrase is also observable in his actions as he first repeats the focal phrase (45), leans forward to his phone, and repeats the focal phrase to his phone (54). These actions show that Ali orients to the focal phrase as being important for his own learning process.

The interaction in Excerpt 2 is the first occurrence of Ali collecting the focal phrase-related language on his phone in our dataset. He uses the affordances of the phone to translate the focal phrase into his first language and to save it as a note. Soon after Excerpt 2, other students leave the classroom for a lunch break, but Ali remains and starts writing something in his notebook. We mention this here because the notebook again be-

comes relevant in the reflection phase of the pedagogical intervention (see Excerpt 5).

Reflecting on Marketplace Interactions

Next, we will move on to analyzing Ali's smartphone use in the last phase of the three-phase pedagogical intervention. The focal phrase about the opening hours was revisited during the retrospective discussions in the classroom. The retrospective discussions were meant to serve as situations for reflection—that is, for analyzing the marketplace interactions and for gaining a deeper understanding of the language use in them (see Knutson, 2003; Walsh & Mann, 2015)—and took place twice: right after the students' visit to the marketplace and then again after 7 days. Excerpts 3 and 4 come from the first retrospective discussion that took place the same day as the marketplace visit. The excerpts illustrate how Ali orients to his smartphone to remember the focal phrase, use it, and learn about other ways to ask for the opening hours.

Excerpt 3 comes from a situation in which one of the video-recorded marketplace interactions has been watched after the visit. In the video, the question about the opening hours was not asked, but the person interacting in it (Jamal) was encouraged to ask it by his fellow student Musa. Ali was present in the marketplace situation but did not say anything. When the video ends, everyone applauds, and the teacher compliments the student in the video (Jamal) for having been brave (23).

After the teacher's praise of Jamal's courage, Ali makes a comment about Jamal's video (30–38). He starts the comment by articulating the name of a fellow student, Musa, by pointing in Musa's direction and simultaneously articulating the noun *kysymys* 'question' (30). He then glances toward Musa (31) and continues verbally by producing the beginning of the phrase about the opening hours *mihin aika on* 'what time is,' and by pointing toward Musa (see Figure 8, Figure 9). Next, Ali turns his gaze toward the phone (36) and then produces the focal phrase as a whole, observably reading it from his phone screen (37).

In Excerpt 3, the smartphone thus supports Ali's participation in the whole-class discussion and helps him to make an observation about the language use of a peer student. According to our interpretation, he is saying that in the situation observable in the video, Musa had encouraged Jamal to ask about opening hours. After having articulated the beginning of the focal question

EXCERPT 3

Ali's gaze *

Ali's embodied conduct +

21 TEA2 **hyvä:** †Jama::*1
well done Jamal
 ali ->*gazes twd smartphone-> (23)

22 ASI **hyvä,** [sama, sama (-)]
good same same

23 TEA1 [Ja-*Jamal] **oli rohkea?**
Jamal was brave
 ali ->*gazes twd TEA1-> (31)

((appr. 5 lines omitted, during this time ALI is gazing toward TEA1))

29 TEA1 **mutta Jamal oli [Jamal oli]**
but Jamal was Jamal was

30 ALI [Musa +kysy:mys] +
Musa a question
 +points twd MUS+

31 ***(.)**
 ali ->*glances twd Mus->

32 TEA1 †joo*
yeah
 ali ->*gazes twd TEA1-> (36)

33 SAF **hyvä**
good

34 TEA1 †hyvä
good

35 ALI **mihin +aika on:#**
what.ILL time be.3SG
what time is
 +points at MUS->
 fig #fig.8

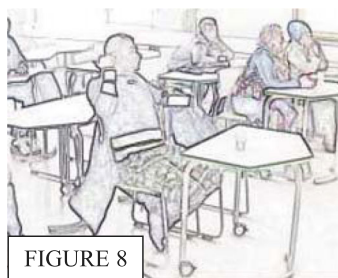


FIGURE 8

36 ***(.) +(0.5) (2.2)#**
 ali ->*gazes twd smartphone->
 ->+
 fig #fig.9

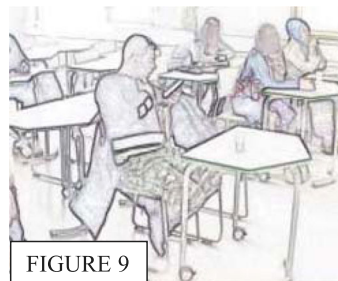


FIGURE 9

37 ALI **mihin aika, (.) on: (.) au*ki,**
what.ILL time be.3SG open
what time (.) is (.) open, ((reads aloud))
 ->*gazes twd TEA1->

phrase once (35), Ali orients to his phone and— with its support—is able to produce the entire phrase. Ali's orientation to his phone and the act of searching for the phrase demonstrate two important things: First, it shows that he is able to monitor his own speech production and to notice that there is something missing from the phrase he just uttered. Second, it also shows that Ali knows that he has the help available on the phone. Thus, his actions are an illustration of extended

cognition: With the help of his phone, he is able to formulate the phrase more precisely than without it.

Excerpt 4 shows what happens later in the same retrospective discussion after the class has watched another video-recorded service encounter. The student in the video has also asked about the opening hours of the stand he visited— but this time the question was formulated differently.

EXCERPT 4

Ali's gaze *

Ali's embodied conduct +

TEA1's embodied conduct ^

- 10 TEA1 eli AH- Ahmed kysyy
so AH- Ahmed asks
- 11 milloin on auki (.) *milloin on auki
when is open when is open
ali *gazes twd TEA1-> (18)
- 12 ALI (-)
- 13 TEA1 aam ja hän kysyy [aina monelta]
aam and he always asks what time,
- 14 ALI [milloin on auki]
when is open
- 15 TEA1 monelta au- (.) aukeaa (.)
what time o- opens
- 16 monelta aukastaan (.) monelta+ au|ki. +
what time is it opened (.) what time open
ali +takes phone in hand and sets it
in front of mouth+
- 17 (1.5) ((the teacher starts writing the phrase on flip chart))
- 18 TEA1 .hhh aa ja sitten hän +sanoo mit- +*saman mitä Musalle
.hhh aa and then she says as- the same as to Musa
ali +taps the screen
of the phone +
->*gazes twd phone-> (24)
- 19 ALI #milloin [on auki]
when is open ((talks to the phone))
- 20 TEA1 [↑aamulla] kahdeksan?
in the morning at eight?
- 21 (.)
- 22 TEA1 *lauantaina on kello yhdeksän,
on Saturday it is at nine o'clock
*a female voice in Ali's phone says something in Arabic
- 23 >sunnuntaina kello kymmenen.<
on Sunday at ten o'clock
- 24 *(2.5)
ali ->*glances fwd, then gazes back to phone->
- 25 SAF (Pashto/Farsi to Jamal)
- 26 (0.6) ^ (2.5)
teal ^turns on the video-> ((video playing until 1. 32))
- 27 ALI milloin on auki +(0.6) +milloin
when is open (0.6) when
+puts phone back
on desk+
- 28 (1.2)*
ali ->*gaze twd the video-> (32)
- 29 MUS (Arabic to SAF)

30 (2.5)

31 ALI milloin sinä tulee (.) milloin on auki
 when you come when is open

32 ^*+ (.)
 teal ^stops the video
 ali ->*gazes twd TEAL-> (41)
 +raises eyebrows-> (39)

33 TEAL sitten [ää Ahmed sanoo]
 then ää Ahmed says

34 ALI [+milloin sinä tulee]
 when you come

35 TEAL mehua?
 juice?

36 ALI sama?+
 the same?

37 ? °;appelssiini°
 orange

38 TEAL mm

39 ALI +kysymys
 a question
 ->+

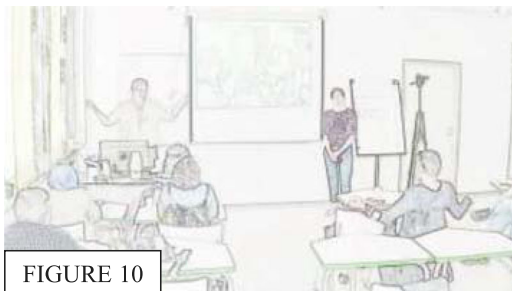
40 TEAL joo?
 yeah

41 ALI *milloin sinä +*tulee +(. milloin sinä +auki, +
 when 2SG come.3SG when 2SG open +
 when you come (.) when you open
 ->*glances twd video*gazes twd TEAL->
 +beckoning gesture+ +points fwd+

42 [sama?]
 the same

43 TEAL [m: ^milloin] sinä ^avaat ^
 w-when do you open ^
 ^opens her hands in front of her torso
 ^puts Hs back together^

44 ^avaa[t,]#
 open.2SG
 you open
 ^opens her hands sideways->
 fig #fig.10



EXCERPT 6

01 TEA1 *vie:lä? (.) mitä muuta, (.) on tärkeää*
more (.) what else (.) is important

((3 lines omitted))

05 TEA1 *siellä, <toril[la>]*
there in the marketplace

06 ALI *[mitä on auki]*
what is open

07 TEA1 *mihin-mihin aikaan on <au:↑ki>*
wha-what time is open

explicitly noticed that there are two different ways to pose the question about the opening hours.

In this excerpt, Ali does not use the phone anymore, but instead, orients to his notebook to remember the question. In a similar way as the phone, the notebook is a cognitive artifact, extending Ali's cognitive abilities: The notes in the book support him in remembering the different ways of formulating the focal questions. Thus, his cognition is distributed among the notebook, the teacher's gestural enactments, and his memory. It is also noteworthy that at this point he does not need the affordances of the Google Translate application on his phone anymore.

In the very final stage of the learning activity, the teachers solicited the students to explain what they had found important and learned during the process. Excerpt 6 illustrates how Ali once again explained that he considered the question about the opening hours to be crucial.

The teacher asks what the students think was essential in the marketplace (1, 5). Ali responds spontaneously by mentioning the focal question, which is corrected by the teacher (7). Ali himself thus considered this question to be an important learning achievement.

DISCUSSION

This article has illustrated how a focal L2 student with emerging literacy used his smartphone during the different phases of a pedagogical task that included interaction both in the language classroom and outside in the marketplace. The analysis concentrated on the focal student's use of a smartphone in noticing, using, and reflecting on the question about opening hours. We have shown that in the preparation phase of the pedagogical intervention, the focal student, Ali, drew on his phone to take photos of the language in the marketplace (Figure 7). In the classroom discussion, Ali first noticed the formulation of ask-

ing about opening hours, checked its meaning with the Google voice recognition application, and saved the result (phrase) on his phone as a picture (Excerpt 2; Figure 6). Then he asked the question in his interaction in the marketplace with the support of the notes on the phone (Excerpt 1). In the retrospective discussion back in the classroom, he reused the phrase with the help of the phone and made a connection to another formulation that can be used to implement the same social action (Excerpt 3–5). Overall, the analyzed excerpts show that the smartphone has a central role both in the focal participant's language use and in the learning project that he carries out through the different interactions.

The analysis highlights the observation that the affordances of the smartphone are beneficial for language use and learning. In particular, for L2 learners with emerging literacy, the voice recognition features are useful. We showed how Ali used the Google Translate application with voice recognition features and spoke the focal phrase to the phone to check its meaning in his first language (Excerpt 2). The phone provided the translation in both a spoken and written modality. The application thus provided Ali with affordances that would not otherwise have been available in the classroom. Notably, Ali oriented to the same feature again when he encountered the similar yet differently formulated phrase, which he also checked with his phone (Excerpt 3). Accordingly, it can be argued that the speech recognition feature is supportive for learners with emerging literacy (see also Artamonova & Androustopoulos, 2020; Pettitt, 2017). In addition, the phone's affordances make notes easily searchable and provide possibilities for creating the user's own systems for organizing information. The self-created systems may be more effective for personal use and for finding information than the fixed order of a notebook (see also Smyser, 2019). This was observable in that it did not take Ali long to find

his notes on the phone in the interaction in the marketplace.

This article has shown how the situated use of a smartphone augments the resources available for social action and supports the L2 literacy learner in participating in pedagogical interactions in competent ways. We have referred to the smartphone as a personal cognitive artifact, as it is a man-made device that supports its users' cognitive abilities (Norman, 1991). The concept of cognitive artifact has been criticized in previous research, which has pointed out that not only man-made objects but also features in nature may extend our cognitive abilities, such as stars in the night sky providing guidance on how to navigate at sea (Hutchins, 1995). In addition, no artifact as such provides cognitive support unless it is used. An artifact thus becomes a 'cognitive artifact' through use (see also Clark & Chalmers, 1998). Our analysis has illustrated precisely how Ali used the phone as cognitive support. This is important, because Ali's use of the smartphone in the interactions was unprompted and thus illustrates the individualized methods he developed to navigate the interactions. Identifying and understanding such methods is useful to understand the role of mobile technology in general and personal cognitive artifacts in particular in L2 use and learning.

The multimodal CA presented in this article has illustrated how the distributed nature of cognition is observable in the interactional use of artifacts and embodied resources. Throughout the analysis, we have referred to the smartphone as 'supporting' Ali's language use and 'augmenting' his possibilities for participation. We have thus treated the phone and Ali as separate entities and have not gone as far as to say that the phone is part of Ali's cognitive processes—even if it certainly extends his cognitive resources. However, the radical version of the extended cognition thesis would probably have argued that the phone is part of Ali's cognitive processing, as it is thought that the environment and relevant artifacts should not be seen merely as an aid in human cognitive processing but rather as part of it (Clark & Chalmers, 1998). While this question is important for the current theorizing of human cognition and its extended characteristics, for us as linguists interested in L2 use and learning, the most important observations concern the sophisticated ways Ali used the phone in interaction to enhance his possibilities for participation. The analysis has shown in detail that the use of the phone matters for how Ali used the language of interaction and engaged in an individual learning project that bridges the

different language-use situations in the classroom and beyond. Without the phone, this would probably have been much more challenging.

Previous research on smartphone use in pedagogical situations has recurrently discussed how the use of personal devices may disturb teaching and concentration in the classroom (for a review, see Sahlström et al., 2019). In the analysis presented in this article, the perspective is the opposite: The smartphone does not disturb learning or teaching—rather, it is beneficial and enhances the focal participant's possibilities for participation. Our analysis thus suggests that it may not be useful to see the use of smartphones or notes in interaction as a way of compensating for lexical or other linguistic deficiencies. Instead, it should be seen as a natural and important part of interaction and learning. We think that students should be encouraged to use the support materials that they feel are helpful for them. In the process of learning, cognitive artifacts can be seen to function as 'scaffolds' (see van Lier, 2004), that is, as support systems that help the L2 user to act in interactionally competent ways. Learners might also benefit from understanding that being interactionally competent does not mean that one has to accomplish social actions individually and alone. Rather, the sophisticated use of the environment and artifacts as resources for formulating social actions can be regarded as part of interactional competence.

The data for our paper came from a pedagogical experiment with a group of adult learners who had been institutionally identified as L2 learners with emerging literacy. This group of learners has been understudied in L2 acquisition research, and the few existing studies focus especially on their acquisition of basic reading skills and on the prerequisites for them, such as phonological awareness (see Kurvers, 2015; Malessa, 2018; Pettitt & Tarone, 2015; Peyton & Young-Scholten, 2020; Tammelin-Laine & Martin, 2015; Tarone, Hansen, & Bigelow, 2013). Only very recently, some studies have focused on the technology use of these learners (Artamonova & Androutsopoulos, 2020; Pettitt, 2017; Smyser, 2019), and our analysis adds to this research line.

Previous CA work on the use of material objects by language learners has primarily concerned university-level students and focused on their literacy practices (see Kunitz, 2015; Markee & Kunitz, 2013; Mori & Hagasewa, 2009). Our analysis has illustrated the individualized methods that the focal learner himself had developed in order to use and learn the language of his new home country. The analysis shows the sophisticated ways the focal

learner used his phone and navigated the different interactions of the pedagogical task (see also Rowsell et al., 2013). Our analysis is thus also an illustration of the many competences that adult L2 users are equipped with regardless of their possibly interrupted history of formal schooling. Language educators would do well to concentrate on the many competencies of adult L2 learners with emerging literacy instead of treating them as a somehow different group of learners. Because of this, it is important to become aware of the methods that such active learners draw on in their learning processes in order to design pedagogical activities that would also support those learners who need more guidance in taking responsibility for their learning (see also Dooly, 2018). L2 teachers are the key actors in designing learning environments (see also Hall, 2019). We hope that the analysis presented here may give future teachers some inspiration to create learning activities that encompass language-use environments also outside the classroom. After all, the ultimate purpose of all teaching is to equip learners with competencies that are useful in the social reality of their life-worlds.

ACKNOWLEDGMENTS

This research was funded by Emil Aaltonen Foundation and Finnish Cultural Foundation. The authors are also very grateful to Arja Piirainen-Marsh, three anonymous reviewers, and the journal editor, Marta Antón, for all the insightful comments on the manuscript. All remaining errors are their own.

NOTES

¹ In Finland, integration training is based on personalized integration plans in which the integration period typically lasts for 2–3 years. The training focuses on language: The integration training involves a maximum of 2,100 hours of training for newcomers, approximately two thirds of which is language training (OECD, 2018).

² The pedagogical experiment involved a lot of planning and choices that were informed both by previous pedagogical interventions that had been conducted using similar kinds of practices and by our knowledge of the participants and their learning habits gained during the ethnographic fieldwork. The details of the pedagogical choices cannot all be spelled out here because of space restrictions. Therefore, we have decided to give only information that is necessary in order to follow the analysis (for similar pedagogical experiments, see Lilja & Piirainen-Marsh, 2019a, 2019b).

REFERENCES

- Aarsand, P., & Forsberg, L. (2009). Producing corporeal privacy: Ethnographic video recording as material discursive practice. *Qualitative Research, 10*, 249–268.
- Artamonova, O., & Androutsopoulos, J. (2020). Smartphone-based language practices among refugees: Mediational repertoires in two families. *Journal for Media Linguistics, 2*, 60–89.
- Bigelow, M., & King, K. (2014). Somali immigrant youths and the power of print literacy. *Writing Systems Research, 7*, 4–19.
- Bigelow, M., & Tarone, E. (2004). The role of literacy level in second language acquisition: Doesn't who we study determine what we know? *TESOL Quarterly, 38*, 689–710.
- Bigelow, M., Vanek, J., King, K., & Abdi, N. (2017). Literacy as social (media) practice: Refugee youth and native language literacy at school. *International Journal of Intercultural Relations, 60*, 183–197.
- Council of Europe. (2001). *Common European Framework of Reference for Languages: Learning, teaching, assessment*. Cambridge: Cambridge University Press.
- Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis, 58*, 7–19.
- DiDomenico, S., & Boase, J. (2013). Bringing mobiles into the conversation: Applying conversation analytic approach to the study of mobiles in copresent interaction. In D. Tannen & A. M. Trester (Eds.), *Discourse 2.0: Language and new media* (pp. 119–132). Washington, DC: Georgetown University Press.
- Dooly, M. (2018). "I do which the question": Students' innovative use of technology resources in the language classroom. *Language Learning & Technology, 22*, 184–217.
- Drew, P. (1997). 'Open' class repair initiators in response to sequential sources of trouble in conversation. *Journal of Pragmatics, 28*, 69–101.
- Eskildsen, S. W., & Markee, N. (2018). L2 talk as social accomplishment. In R. A. Alonso (Ed.), *Learning to speak in an L2* (pp. 69–103). Amsterdam: John Benjamins.
- Gonzalves, L. (2020). Development and demonstration of metalinguistic awareness in adult ESL learners with emergent literacy. *Language Awareness, https://doi.org/10.1080/09658416.2020.1776721*
- Greer, T. (2019). Noticing words in the wild. In J. Hellermann, S. W. Eskildsen, S. Pekarek Doehler, & A. Piirainen-Marsh (Eds.), *Conversation analytic research on learning-in-action: The complex ecology of second language interaction in the wild* (pp. 131–158). Cham, Switzerland: Springer Nature.
- Hall, J. K. (2019). The contributions of conversation analysis and interactional linguistics to a usage-based understanding of language:

- Expanding the transdisciplinary framework. *Modern Language Journal*, 103, 80–94.
- Hellermann, J. (2018a). Linguaging as competencing: Considering language learning as enactment. *Classroom Discourse*, 9, 40–56.
- Hellermann, J. (2018b). Talking about reading: Changing practices for a literacy event. In S. Pekarek Doehler, J. Wagner, & E. González-Martínez (Eds.), *Longitudinal studies on the organization of social interaction* (pp. 105–142). London: Palgrave Macmillan.
- Hellermann, J., Eskildsen, S. W., Pekarek Doehler, S., & Piirainen-Marsh, A. (Eds.). (2019). *Conversation analytic research on learning-in-action: The complex ecology of second language interaction in the wild*. Cham, Switzerland: Springer Nature.
- Hellermann, J., & Harris, K. (2015). Navigating the language-learning classroom without previous schooling. In D. A. Koike & C. S. Blyth (Eds.), *Dialogue in multilingual, multimodal and multicompetent communities of practice* (pp. 49–77). Amsterdam: John Benjamins.
- Hutchby, I. (2001). Technologies, texts and affordances. *Sociology*, 35, 441–456.
- Hutchins, E. (1995). *Cognition in the wild*. Cambridge, MA: MIT Press.
- Jefferson, G. (2004). Glossary of transcript symbols with an introduction. In G. H. Lerner (Ed.), *Conversation analysis: Studies from the first generation* (pp. 13–31). Amsterdam: John Benjamins.
- Kääntä, L. (2014). From noticing to initiating correction: Students' epistemic displays in instructional interaction. *Journal of Pragmatics*, 66, 86–105.
- King, K. A., Bigelow, M., & Hirs, A. (2017). New to school and new to print: Everyday peer interactions among adolescent high school newcomers. *International Multilingual Research Journal*, 11, 137–151.
- Koivisto, A. (2009). Kiitoksen paikka. Kiittäminen kioskiasiointia jäsentämässä. [Time to say thank you. Thanking as a boundary marker in service encounters.] In H. Lappalainen & L. Raevaara (Eds.), *Kieli kioskilla: Tutkimuksia kioskiasioinnin rutiineista* [The language use in convenience stores: Studies on the routines in service encounters in convenience stores] (pp. 174–200). Helsinki, Finland: Finnish Literature Society.
- Knutson, S. (2003). Experiential learning in second-language classrooms. *TESL Canada Journal*, 20, 55–64.
- Kunitz, S. (2015). Scriptlines as emergent artifacts in collaborative group planning. *Journal of Pragmatics*, 76, 135–149.
- Kurvers, J. (2015). Emerging literacy in adult second-language learners: A synthesis of research findings in the Netherlands. *Writing Systems Research*, 7, 58–78.
- Lilja, N. (2018). “Mä opin sitä kadulla kavereitten kanssa”: Suomen kielen käyttöön ja oppimiseen liittyviä kategorisointeja maahanmuuttajanuorten haastattelupuheessa. [“I learn on streets with friends”]: Young adult immigrants categorizing the opportunities for using and learning Finnish as L2]. *Puhe ja Kieli*, 38, 203–225.
- Lilja, N., & Piirainen-Marsh, A. (2019a). Connecting the language classroom and the wild: Reenactments of language use experiences. *Applied Linguistics*, 40, 594–623.
- Lilja, N., & Piirainen-Marsh, A. (2019b). Making sense of interactional trouble through mobile supported sharing activities. In M. R. Salaberry & S. Kunitz (Eds.), *Teaching and testing L2 interactional competence: Bridging theory and practice* (pp. 260–289). New York: Routledge.
- Majlesi, A. (2015). Matching gestures: Teachers' repetitions of students' gestures in second language learning classrooms. *Journal of Pragmatics*, 76, 30–45.
- Majlesi, A. (2018). Instructed vision: Navigating grammatical rules by using landmarks for linguistic structures in corrective feedback sequences. *Modern Language Journal*, 102, 11–29.
- Majlesi, A., & Broth, M. (2012). Emerging learnables in second language classroom interaction. *Learning, Culture and Social Interaction*, 14, 193–207.
- Malessa, E. (2018). Learning to read for the first time as adult immigrants in Finland: Reviewing pertinent research of low-literate or non-literate learners' literacy acquisition and computer-assisted literacy training. *Journal of Applied Language Studies*, 12, 25–54.
- Markee, N., & Kunitz, S. (2013). Doing planning and task performance in second language acquisition: An ethnomethodological respecification. *Language Learning*, 63, 629–664.
- Maynard, D. W. (2003). *Bad news, good news: Conversational order in everyday talk and clinical settings*. Chicago, IL: University of Chicago Press.
- Mondada, L. (2018). Multiple temporalities of language and body in interaction: Challenges for transcribing multimodality. *Research on Language and Social Interaction*, 51, 85–106.
- Mondada, L. (2019). Contemporary issues in conversation analysis: Embodiment and materiality, multimodality and multisensoriality in social interaction. *Journal of Pragmatics*, 145, 47–62.
- Mondada (n.d.). *Conventions for multimodal transcription*. Accessed 5 November 2020 at <https://www.lorenzamondada.net/multimodal-transcription>
- Mori, J., & Hagasewa, A. (2009). Doing being a foreign language learner in a classroom: Embodiment of cognitive states as social events. *International Review of Applied Linguistics in Language Teaching*, 47, 65–94.
- Norman, D. (1991). Cognitive artifacts. In J. M. Carroll (Ed.), *Designing interaction: Psychology at the human-computer interface* (pp. 17–38). New York: Cambridge University Press.
- OECD. (2018). *Working together: Skills and labour market integration of immigrants and their children in Finland*. Paris: OECD Publishing.

- Pekarek Doehler, S. P. (2019). On the nature and the development of L2 interactional competence: State of the art and implications for praxis. In R. Salaberry & S. Kunitz (Eds.), *Teaching and testing L2 interactional competence: Bridging theory and practice* (pp. 25-59). New York: Routledge.
- Pekarek Doehler, S. P., & Pochon-Berger, E. (2015). The development of L2 interactional competence: Evidence from turn-taking organization, sequence organization, repair organization and preference organization. In T. Cadierno & S. W. Eskildsen (Eds.), *Usage-based perspectives on second language learning* (pp. 233-268). Berlin: Mouton de Gruyter.
- Pettitt, N. (2017). *Social positioning in refugee women's education: A linguistic ethnography of one English class*. (Unpublished doctoral dissertation). Atlanta, GA: Georgia State University.
- Pettitt, N., & Tarone, E. (2015). Following Roba: What happens when a low-educated adult immigrant learns to read. *Writing Systems Research*, 7, 20-38.
- Payton, J. K., & Young-Scholten, M. (Eds.). (2020). *Teaching adult immigrants with limited education. Theory, research and practice*. Bristol, UK: Multilingual Matters.
- Raclaw, J., Robles, J. S., & DiDomenico, S. M. (2016). Providing epistemic support for assessments through mobile-supported sharing activities. *Research on Language and Social Interaction*, 49, 362-379.
- Raudaskoski, S. (2009). *Tool and machine: The affordances of the mobile phone*. (Doctoral thesis). Tampere University, Tampere, Finland). Accessed 30 December 2020 at <https://trepo.tuni.fi/bitstream/handle/10024/66528/978-951-44-7802-4.pdf?sequence=1&isAllowed=y>
- Rowsell, J., Kress, G., Pahl, K., & Street, B. (2013). The social practice of multimodal reading: A new literacy studies—Multimodal perspective on reading. In D. E. Alvermann, N. Unrau, & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (pp. 1,182-1,207). Newark, DE: International Reading Association.
- Sahlström, F., Tanner, M., & Olin-Scheller, C. (2019). Smartphones in classrooms: Reading, writing and talking in rapidly changing educational spaces. *Learning, Culture and Social Interaction*, 22, 1003-19.
- Schmidt, R. (2012). Attention, awareness, and individual differences in language learning. In W. M. Chan, K. N. Chin, S. Bhatt, & I. Walker (Eds.), *Perspectives on individual characteristics and foreign language education* (pp. 27-50). Boston, MA: De Gruyter Mouton.
- Sidnell, J. (2010). *Conversation analysis: An introduction*. Oxford: Wiley-Blackwell.
- Smyser, H. (2019). Adaptation of conventional technologies with refugee language learners: An overview of possibilities. In E. Sengupta & P. Blessinger (Eds.), *Language, teaching, and pedagogy for refugee education* (pp. 125-139). Bingley, UK: Emerald.
- Tai, K. W. H., & Brandt, A. (2018). Creating an imaginary context: Teacher's use of embodied enactments in addressing learner initiatives in a beginner-level adult ESOL classroom. *Classroom Discourse*, 9, 244-266.
- Tammelin-Laine, T., & Martin, M. (2015). The simultaneous development of receptive skills in an orthographically transparent second language. *Writing Systems Research*, 7, 39-57.
- Tarone, E., & Bigelow, M. (2012). A research agenda for second language acquisition of pre-literate and low-literate adult and adolescent learners. In P. Vinogradov & M. Bigelow (Eds.), *Proceedings from the 7th annual LESLLA (Low Educated Second Language and Literacy Acquisition) symposium* (pp. 5-26). Minneapolis, MN: University of Minnesota.
- Tarone, E., Hansen, K., & Bigelow, M. (2013). Alphabetic literacy and second language acquisition by older learners. In J. Herschensohn & M. Young-Scholten (Eds.), *The Cambridge handbook of second language acquisition* (pp. 180-203). Cambridge: Cambridge University Press.
- Telakivi, P. (2020). *Extending the extended mind. From cognition to consciousness*. (Unpublished doctoral dissertation). Helsinki, Finland: University of Helsinki.
- Thomas, M., Reinders, H., & Warschauer, M. (Eds.). (2013). *Contemporary computer-assisted language learning*. London: Bloomsbury.
- Thorne, S. L., Hellermann, J., Jones, A., & Lester, D. (2015). Interactional practices and artifact orientation in mobile augmented reality game play. *PsychNology Journal*, 13, 259-286.
- UNESCO Institute for Statistics. (2020). *Literacy*. Accessed 1 November 2020 at <http://uis.unesco.org/en/topic/literacy>
- Wagner, J. (2015). Designing for language learning in the wild: Creating social infrastructures for second language learning. In T. Cadierno & S. W. Eskildsen (Eds.), *Usage-based perspectives on second language learnings* (pp. 75-102). Berlin: De Gruyter Mouton.
- Wagner, J. (2019). Toward an epistemology of second language learning in the wild. In J. Hellermann, S. W. Eskildsen, S. Pekarek Doehler, & A. Piirainen-Marsh (Eds.), *Conversation analytic research on learning-in-action: The complex ecology of second language interaction in the wild* (pp. 251-271). Cham, Switzerland: Springer Nature.
- Walsh, S., & Mann, S. (2015). Doing reflective practice: A data-led way forward. *ELT Journal*, 69, 351-362.
- Waring, H. Z., Creider, S., Terpey, T., & Black, R. (2012). Understanding the specificity of CA and context. *Discourse Studies*, 14, 477-479.
- van Lier, L. (2004). *The ecology and semiotics of language learning: A sociocultural perspective*. Dordrecht, the Netherlands: Kluwer Academic Publishers.
- Varela, F. J., Thompson, E., & Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge, MA: MIT Press.

APPENDIX

Transcription Symbols

.	Falling intonation
,	Level intonation
?	Rising intonation
↑	Rise in pitch
↓	Fall in pitch
<u>auki</u>	Emphasized talk
JOO	Increased volume
:	Lengthening of the sound
<auki>	Slower than surrounding talk
>auki<	Faster than surrounding talk
°kiitos°	A passage of talk quieter than the surrounding talk
[Utterances starting simultaneously
]	Point where overlap stops
.h	In breath
h	Audible aspiration
(.)	Micropause, less than 0.2 s
(0.5)	Silences times in tenths of a second
=	No silence between two adjacent utterances
()	Item in doubt
(-)	Indecipherable talk
((lines omitted))	Transcriber's comments
mi-	Cut-off

Multimodal transcription follows the conventions developed by Mondada. Conventions available at: <https://www.lorenzamondada.net/multimodal-transcription>

Glossing Symbols Used

Case ending

ILL Illative

Others

PRT	Particle
SG	Singular
1	1 st person ending
2	2 nd person ending
3	3 rd person ending

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.