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Lexical and syntactic alignment during English-Spanish teletandem meetings

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A B S T R A C T

First language (L1) interactants quickly develop a coordinated form of communication, reusing each other's linguistic choices and aligning to their partner (Pickering & Garrod, 2021). More recently, research became interested in second language (L2) alignment (cf., Kim & Michel, this issue). Earlier work has shown that both lexical and syntactic alignment can be found in L2 dialogue, with task type and context as potential mediating factors (e.g., Dao, Trofimovich, & Kennedy, 2018). This study adds to the existing work on alignment in second language production by exploring task effects in English-Spanish teletandem conversations.

Twenty-nine English-Spanish tandem pairs completed video-based free conversation and Spot-the-Difference tasks, alternating the language of communication: both participants acted as L2 learner and as L1 expert in turns. The 174 task performances were scrutinized for alignment by identifying the number of overlapping lexical and syntactic n-grams (cf., Michel & Smith, 2018). We compared alignment between paired students (i.e., real pairs) to 'coincidental overlap' in created conversations of randomly combined speaker pairs.

Results showed significantly more alignment by real than random pairs, and more syntactic than lexical alignment, while task effects were mixed. We discuss our findings in light of telecollaborative task-based interaction as support for L2 development.

Dialogue is one of the most natural ways of using language. It is through dialogue that children learn their mother tongue and that humans express and expand their thoughts as they communicate. Also for second language learning, dialogues are crucial. The interactionist approach within Second Language Acquisition (SLA) theory sees dialogues as the locus for essential language learning processes, such as receiving input and producing output, negotiation processes and interactional feedback, which all support focus on form and noticing within meaning oriented communication (cf. Loewen & Sato, 2018; Long, 1996; Mackey, Abbuhl, & Gass, 2013).

In recent years, research into second language (L2) interaction has started to investigate a further intriguing aspect of dialogic language processing, namely, alignment (cf. Jackson, 2018; Kim & Michel, this issue; McDonough, 2006). Alignment refers to the pragmatically unmotivated habit of humans to copy their partner's language use during natural conversations (Bock & Griffin, 2000). In the current paper, we will use 'alignment' as an overarching term for the phenomenon under investigation, knowingly simplifying the intricate relationship between processes of alignment, priming and entrainment (see Kim & Michel, this issue, for a detailed discussion). While alignment in a speaker's first language (L1) seems to affect all levels of communication (i.e., at the lexical, syntactic, phonological or pragmatic level) and recent findings suggest even alignment of gaze patterns and gestures (Bergmann & Kopp, 2012; Hadelich & Crocker, 2006; Oben, 2018; see also Cappellini, Holt, & Hsu, 2022, this issue, for alignment of facial expressions) further research is needed to increase our understanding of alignment in L2 conversations.

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In this paper, we investigate alignment in the context of teletandem conversations, that is, digitally mediated video-based interactions between learners of each other's native languages, who take turns in what language they speak (Telles, 2015). As such, both interactants alternate in serving as L1 expert or L2 learner, benefitting from each other's input and the opportunities for output provided. The concept of language tandem partnerships is not new. With growing availability of digital technology, the past decades have seen a growth in teletandem interactions, where tandem partners engage with each other across borders and time zones drawing on the affordances of digital communication. Universities and schools across the world have started to facilitate teletandem exchanges, providing online environments where tandem partners can meet and work collaboratively, for example, on tasks that guide their conversations. The current study investigates alignment (Pickering & Garrod, 2021) in the context of task-based teletandem interactions between English and Spanish speakers engaging in video-based conversations. To date, little is known about how the affordances of the digital environment as well as the specific set-up of task-based teletandems might elicit and influence alignment in those L2 conversations (see Cappellini et al., 2022, this issue; Michel & Cappellini, 2019; for exceptions). The aim of the present study is to address this gap and provide insights into alignment in digitally mediated tandem exchanges.

We will first review the literature on L1/L2 alignment as well as teletandem language learning before we report on the method and design of our study, which presents an innovative approach to gauge alignment: we combine Part-of-Speech (PoS)-tagging and n-gram analyses to compare overlapping lexical and syntactic trigrams in real versus random conversations. We discuss our results by highlighting the role of alignment for language learning in the specific context of video-based teletandem exchanges.

1. Literature review

1.1. Defining alignment

In their recent comprehensive volume on understanding dialogue, Pickering and Garrod (2021) define alignment as 'the extent to which individuals represent things in the same way as each other' (p. 1). Their theory on language use and social interaction sees dialogue as a joint activity where two (or more) interlocutors cooperate. In this view, alignment of both the joint situational model and the linguistic means to express the mental representations are closely intertwined as they are 'fundamental to communicative success' (p. 1, ff.). In empirical research, the concept of alignment has often been referred to as our tendency to copy the linguistic form (morphosyntax, lexicosemantics, pragmatics, phonology) of recent discourse (Bock & Griffin, 2000). Indeed, in natural conversation, interlocutors seem to unconsciously and automatically repeat the linguistic choices made by their speaking partner. According to Pickering and Garrod (2004, 2006, 2021), the joint activity builds on concepts of mental alignment, simulation, prediction and synchrony that all add to mutual understanding in the shared 'workspace' of a dialogue.

1.2. Alignment and (instructed) SLA

An extensive body of research has shown that in first language and cross-linguistic processing, this convergence to our dialogic partner is largely due to unconscious and implicit processes (see reviews by Kootstra & Muysken, 2019; Pickering & Ferreira, 2008; Pickering & Garrod, 2004, 2006, 2021). Yet, a second language user draws on a still developing L2 system which is likely to affect the ways in which an L2 speaker might align to their partner. As Costa, Pickering, and Sorace (2008) explain, L2 alignment might be hindered by four main differences between L1 and L2 conversations. First, L2 speakers might not align to their partner because it is hard to use a structure that is not (yet) part of their incomplete L2 knowledge. Second, when viewing alignment as a result of primed activation of structures by recent discourse, processing limitations could imply that automatic alignment does not occur in an L2. Third, L2 speakers could choose to strategically avoid copying their partner because they feel insecure about their capabilities to produce a correct version of a provided language form (e.g., avoiding the use of passive structures). Finally, when two L2 partners are in conversation, speakers might not accept their interlocutor as a trustworthy source for the target language (TL). More recently, Hartsuiker and Bernolet (2017) have identified instructional effects as a further reason for what they call 'blocked priming': if L2 learners have been instructed in the classroom to use a specific preferred form, they might (more or less consciously choose to) stick to the prescriptive form (e.g., German sentences starting with 'weil' [meaning 'because'] requiring a subordinate clause) rather than following a version used by their partner (e.g., using a 'weil'-sentence with main clause word order). Taken together, Costa et al. (2008) suggested that the established findings of L1 research might not be directly transferable to the L2 context.

A decade later, a growing amount of research has started to investigate alignment in L2 conversations. Research into L1 priming provides evidence that priming (or alignment as we call it) can serve as implicit learning (e.g., Dell & Chang, 2014; see also special issue by Dell & Ferreira, 2016), as every instance of aligned language use leaves a cognitive trace. From an SLA perspective, the implicit learning account ties in nicely with a usage-based view on language learning, which sees use as a prerequisite for learning (Tyler & Ortega, 2016). This account also led to investigations into alignment as a pedagogical tool (cf. review by Jackson, 2018).

In their pioneering work, McDonough and colleagues investigated primed production as a means to support language learning. Accordingly, unconscious priming and alignment mechanisms could be exploited to elicit the production of structures by L2 speakers that they would not use under normal circumstances. For example, in a pedagogic interaction, a tutor or (confederate) L1 interlocutor could prime L2 learners to use insalient (e.g., subjunctive in Romance languages) or infrequent (e.g., passive voice) forms or those structures that learners tend to avoid (e.g., subordinate conjunctions that have a coordinating equivalent in Germanic languages such as 'weil' vs. 'denn' both meaning 'because'). Indeed, these early studies demonstrated that L2 users could be triggered to supply correct TL in priming conditions (e.g., McDonough, 2006; McDonough & Kim, 2009; McDonough & Mackey, 2008; cf., edited volume by Trofimovich & McDonough, 2011).

Most of these studies have investigated L2 students in conversation with a tutor or scripted confederate that consciously aimed at eliciting aligned forms in their interlocutor. As Jackson (2018) concludes in her systematic review on priming in SLA, there is a lack of research exploring the occurrence of alignment in naturalistic dialogue, in particular between L2 peers. An exception might be a series of studies by Michel who, with different co-authors, explored alignment during digitally mediated peer interaction via text messaging. In these studies, small but pervasive evidence of aligned language could be demonstrated in the L2 conversations, for example, by using more quantitative approaches such as corpus-based chat-log analyses and eye-tracking methodology, as well as qualitative methods like focus group interviews and stimulated recall. Their findings suggest that, in task-based interaction, L2 learners tend to align to their peers both at a lexical and more so at a structural level, but that tasks and modalities influence the amount of alignment that takes place (Michel & Cappellini, 2019; Michel & O'Rourke, 2019; Michel & Smith, 2018; Michel & Stiefenhöfer, 2019). Furthermore, even though about one third of the lexically aligned language goes hand-in-hand with overt attention – as demonstrated by repeated gaze fixations on a target construction of their interlocutor before re-using it – a large portion of re-use of lexical chunks happens without excessive visual attention to those chunks (Michel & Smith, 2018). Qualitative data of Michel and O'Rourke (2019) allow for the interpretation that students make many strategic - and thus not implicit - decisions on whether or not to align to their partner, for example, based on the perceived proficiency of their peer. Also the investigation of Dao et al. (2018) points towards task effects and individual differences influencing alignment in L2 peer interaction. Given the small-scale nature of these earlier explorations, there is a need for additional work, particularly, drawing on larger sample sizes, to investigate the extent to which alignment occurs naturally in L2 conversations. For the current paper, we examine alignment during free and task-based teletandem conversations.

1.3. Alignment in task-based teletandem language learning

In tandem language learning, learners who are L1 speakers of each other's TL work in pairs to help each other in their language learning process. The principles of autonomy and reciprocity (Little & Brammerts, 1996) underpin the success of tandem partnerships: learners need to take ownership of their language learning process and both members in a pair need to contribute and benefit equally. To guarantee the sustainability, it is necessary that they interact in both languages so that both participants are exposed to their TL by the input produced by a native speaker, and can produce output in an authentic, meaningful context. Tandem learning is further optimized when accompanied by tasks that guide the conversations, pushing participants outside their comfort zone (Appel & Mullen, 2000) and influencing which language structures will potentially be developed (O'Dowd & Ware, 2009).

Since the early 1980s, there have been efforts to organize face-to-face partnerships within formal education contexts (see TANDEM Network, Czico, 2004). Also research on tandem language learning processes using emerging technologies of computer-mediated communication has grown: for example, early studies on using email (Appel & Gilabert, 2002; Belz, 2003; Vinagre, 2005) and later synchronous written communication or text chat (Bower & Kawaguchi, 2011; O'Rourke, 2005), while more recent work explores the potential of oral videoconferencing (Akiyama, 2017; Black & Barron, 2018; Cappellini, 2016; Cappellini et al., 2022, this issue). The current study is in line with this latter strand.

Research on teletandem language learning has explored, for example, focus on form, negotiation of meaning or peer-feedback (Akiyama, 2017; Bower & Kawaguchi, 2011; O'Rourke, 2005). It seems, however, that learners can be reluctant to correct their partners (Edasawa & Kabata, 2007) and that not all feedback is equally valuable (Ware & O'Dowd, 2008), while reflection on peer feedback might promote its effectiveness (Appel & Pujolà, 2021; Bower & Kawaguchi, 2011). To the best of our knowledge, there is limited work investigating unintentional uptake of vocabulary or sentence structures (i.e., alignment) during these conversations. Such information would be a valuable complement to work on focus on form and could inform the design of tandem setups, dynamics and dyad configuration. One exception is Appel and Vogel (2001), who examined the effect of having a single vs. different tandem partner (s) over time. Syntactic priming measurements yielded a stronger priming effect amongst learners who had interacted with different members of a tandem community than between isolated pairs. This study provided evidence of syntactic priming in tandem interaction and suggested dyad configuration design can enhance alignment. More recently, Michel and Cappellini (2019) investigated alignment in German text-based and French-Chinese video-based exchanges. The teletandem data revealed a substantial amount of alignment, in particular, more lexical alignment in Chinese conversations when compared to the French and German interactions, which, in turn, yielded more syntactic overlap. While some of these earlier findings point out target language influences, calling for more languages being explored, both investigations also suggest that the amount and type of partner language uptake depended to a large extent on the task students were working on.

Indeed, tasks in tandem language learning can be used to attune conversations to language learning goals. Akiyama and Cunningham (2018), in a synthesis of 55 telecollaboration projects, put forward four categories of tasks used in teletandem practices: information exchange, comparison and analysis, co-construction and language-focused tasks - the first one being the least structured and the latter the most structured with the purpose of pushing learners to practice specific aspects of the TL. They demonstrated that the type of tasks most frequently used were information exchange tasks, while language-focused tasks were relatively sparse.

So far, there is limited understanding on the type of alignment fostered by different tasks and how this might influence language learning. In face-to-face settings, Dao et al. (2018) showed that there are task differences even within information exchange tasks. In their study, picture-based narratives elicited more aligned structures than map tasks, which they attributed to the more balanced distribution of talk in the former task. In the picture story, both speakers contributed more equally, and as such, also each contributed some of the structures that became part of the joint (aligned) conversation.

1.4. Identifying aligned language: A methodological challenge

A challenge for alignment research in instructed peer interaction is the limited control researchers have over the authentic language use of interactional partners. Earlier work investigating primed production often employed a scripted confederate, who introduced certain target structures into a conversation (e.g., Kim, Jung, & Skalicky, 2019; McDonough & Mackey, 2008). Yet, an advantage of teletandem exchanges is that they elicit spontaneous language use. Consequently, it is a methodological challenge to identify aligned language in these interactions.

In the above-mentioned empirical studies on text chat interactions, Michel and colleagues have triangulated n-gram analyses with eye-tracking methodology to link the focus of visual attention on written contributions of a partner to aligned 3-to-5-grams. Indeed, their findings reveal that lexical n-grams that were repeated by a partner had been visually focused on several times before having been reused (Michel & Smith, 2018). In addition, stimulated recall comments of participants in Michel and O'Rourke (2019) indicated that L2 German learners made conscious decisions as to whether or not to employ a structure they had encountered in their partner's language. Drawing on Dao et al. (2018), Michel and Cappellini (2019) calculated an alignment ratio in order to compare different tasks and contexts. Given that these aforementioned studies relied on hand-coding, only small datasets could be investigated and their conclusions might not be generalizable. Moreover, it remains unclear whether the measured re-use of language indeed is a result of alignment, or whether it is mere coincidence that the same lexical and/or syntactic patterns occur several times in a conversation. In short, there is a need for a more reliable and valid approach to identify and quantify aligned language. The current study aims to address this issue by comparing alignment scores of real versus random conversations as we will present in the following section.

2. The present study

The present study set out to investigate alignment during online video-based English-Spanish teletandem conversations pursuing the overarching first research question is:

RQ1. To what extent do L1-L2 teletandem partners align their language during video-based oral interaction?

Following Michel and Smith (2018), we operationalized alignment as overlapping n-grams. For lexical alignment, we looked at chunks of exactly the same three words that were used by both speaking partners. By combining this n-gram analysis with Part-of-Speech (PoS) tagging, we additionally investigated syntactic alignment, that is, by scrutinizing overlapping trigrams of PoS-tags (e.g., DET-ADJ-NOUN). This allowed us to answer the following second research question:

RQ2. How does alignment of lexical and syntactic n-grams differ?

Given that our corpus included teletandem data on free conversation tasks and spot-the difference tasks, we were also interested in task effects, more specifically, our third research question asked:

RQ3. How does alignment differ depending on task type (free conversation vs. spot-the-difference)?

Based on the work by Michel and Cappellini (2019), we expect that alignment will also take place in teletandem meetings, that more syntactic than lexical alignment might occur, and that task-effects will become apparent (cf. Dao et al., 2018). In the following, we will describe the method and design of our study.

3. Method and design

3.1. Participants

Originally, we looked at data of 62 adult language learners (41 female, 21 male), creating 31 English-Spanish teletandem pairs. Each pair consisted of an English native (UK, US or Irish English) and a Spanish native (Castilian) speaker, learning each other's languages. L1 English speakers were students at the Dublin City University (Ireland) or the Universitat Oberta de Catalunya (Spain), whereas the L1 Spanish speakers were all students at the latter institution. Participants were following a course in their L2, aiming at the B2 level according to the Common European Framework of Reference for languages (CEFR) (Council of Europe, 2001). Twelve pairs belonged to a corpus of data collected in 2008, which were complemented with data of nineteen pairs from 2020. Two pairs, who failed to complete all tasks, were excluded from further analyses, resulting in a final dataset of 29 pair interactions.

3.2. Design, tasks and procedure

A virtual classroom served as a meeting point for L2 learners. This classroom gave participants access to video tutorials and guides on how to find a tandem partner and how to conduct tandem conversations. Moreover, the classrooms were monitored by a teacher who could help students find a person to do the tandem tasks with. Once a tandem meeting was arranged and the conversation started, pairs were required to move forward together, as one would not be able to advance into the following task without their partner doing so. In 2008, 11 pairs completed the tasks through the video-call software Skype and recorded their conversation using an external recorder. In 2020, 18 pairs used the SpeakApps tandem tools (http://www.speakapps.eu) on the tandem MOOC platform (http://mooc.speakapps.org) which automatically recorded and archived the conversations making use of the video-call software BigBlueButton.

During the online meeting, participants worked together on six communicative tasks, starting and ending with a free conversation

('Questions' at the beginning; 'Wrap-up' at the end), and four picture-based Spot-the-Difference tasks (StD) in the middle (Mullen, Appel, & Shanklin, 2009; cf., Appendix). In the 2008 dataset, solutions to the StD tasks were not given until the 'Wrap up' conversation. In the 2020 edition, participants could review their StD answers immediately after each task, while the 'Wrap up' was meant for giving feedback to one another. The free conversation tasks let students interact in their preferred language or use intercomprehension (i.e., each participant talking in their L2) or translanguaging strategies, leading to a mixed language use of English and Spanish. The instructions of the StD tasks included indications on what language (English or Spanish) to use. Accordingly, participants acted both as native speakers and as language learners depending on the different tasks performed.

Our final dataset consisted of 174 task performances (58 free conversations; 116 Spot-the-Difference tasks) by 29 pairs. Half of the StD tasks were completed in English, the other half in Spanish, resulting in a balanced language use (cf. Fig. 1).

3.3. Transcription, coding and analysis

All interactions were transcribed following the CHAT transcription norms (cf. CHILDES, MacWhinney & Snow, 1990). We used the *%mor* tier of CLAN to tag the data for parts of speech (PoS) in English and Spanish. Every transcript was manually controlled to tag unidentified and code-switched words. Next, we extracted chunks of three words and of three PoS-tags for each speaker in each task, resulting in a list of lexical and syntactic (PoS) trigrams respectively. Using Excel, these lists were then compared across speakers within the same conversation to identify overlapping trigrams, that is, aligned structures (cf. Fig. 2). Finally, we calculated the alignment ratio per pair and task for lexical and syntactic overlap by dividing the number of aligned trigrams by the total number of trigrams per conversation. The alignment score was calculated for tokens (i.e., all instances of trigrams) and types (i.e., different trigrams only).

Our procedure allowed us to identify the lexical and syntactic trigrams that were shared (i.e., aligned) by two interactants in a conversation. Notably, our analysis does not take distance between shared uses into account. We opted for this procedure given that we situate our study in ISLA and understand alignment within a framework of (implicit) learning. Accordingly, the use of a structure triggers its reuse later on irrespective of the distance in terms of time or turns between the two uses (Bock & Griffin, 2000).

Given that we wanted to distinguish alignment from coincidental overlap, because people need to talk about items relevant to a given task (e.g., about 'a red ball' vs. 'a blue ball' in a StD task with pictures of different coloured balls), we used the following procedure: each participant's list of lexical and syntactic trigrams was randomly compared to another participant's list, with whom they had not been engaged in a teletandem conversation. That is, we created random pairs, and used the same procedure as explained above to calculate lexical and syntactic alignment ratios for types and tokens in these random 'conversations'. The alignment ratios in random pairs served as our baseline. Finally, all ratios were averaged over task type, so that we ended up with four values per pair: (i) real free conversation; (ii) random free conversation; (iii) real Spot-the-Difference; (iv) random Spot-the-Difference. For the statistical analysis we used RStudio 1.4 (R Core Team, 2020). Data were cleaned of missing values (i.e., 30 in free conversations, 6 in StD) and outlier values were trimmed, for example, $M_{Lex\_tokens} \pm 2\ SD_{Lex\_tokens}$. We used two-way ANOVAs and follow-up Tukey tests to explore differences given that residuals were normally distributed. The alpha level was set to 0.05 and effect sizes (η^2) interpreted as *small* (0.01), *medium* (0.06) and *large* (0.14) respectively.

4. Results

To answer the first research question, whether alignment takes place in teletandem conversations, we compare alignment scores of real vs. random pairs (cf. the descriptives presented per variable in Table 1). As can be seen, real pairs generated consistently higher scores than random pairs, which suggests that alignment indeed is prominent in this medium of conversation.

To answer the second research question comparing scores on lexical versus syntactic alignment for both tokens and types, it is apparent that scores differ substantially, with syntactic alignment yielding high values in the 20s and 30s for tokens and up to 10 for types, respectively. As expected, lexical alignment values (i.e., exact overlap of three words) remain small. Generally, token scores are higher than type scores, suggesting frequent repetition of the same trigrams. Standard deviations of about half the scores indicate large individual variation within the scores of individual pairs.

A two-way ANOVA (Table 2) showed a small but significant main effect of pair (real vs. random): ($F(1,448) = 44.26, p < .001, \eta^2 = 0.021$), and large and significant main effects of alignment type (syntactic vs. lexical: $F(1,448) = 844, p < .001, \eta^2 = 0.42$) and types vs. tokens ($F(1,448) = 370, p < .001, \eta^2 = 0.176$). Also the interactions between these variables turned out significant.

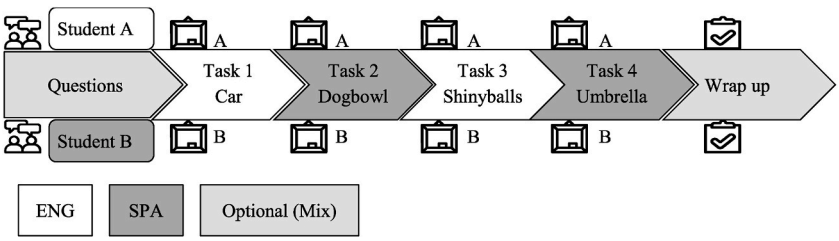


Fig. 1. Study design.

21_024_121	ST024		ST121		ST024+ST121		Total Aligned Tokens	Alignment Ratio
1_3_Shinyballs	12	prep det:art n	4	prep det:art n	2	adj co prep	0	80	0.38
	6	det:art adj n	3	adj n n	2	adj det:art n	0	**Non-Aligned Tokens**	
	5	co co co	3	det:art adj n	1	adj det:num pro:p	0	208	
	5	co prep det:art	2	adj n coord	1	adj n adv	0		
	5	n coord adj	2	co pro:dem cop	1	adj n co	0		
	4	n adv cop	2	det:art det:art adj	1	adj n conj	0		
	3	adj n coord	2	n coord adj	3	adj n coord	**5**		
	3	adj n n	2	pro:sub aux part	2	adj n coord	0		
	3	adv cop adj	1	adj n pro:per	3	adj n n	**6**		
	3	cop adj n	1	adj pro:per cop	3	adj n n	0		
	3	det:art n adv	1	adv pro:per cop	1	adj n pro:per	**2**		
	3	det:art n prep	1	adv v n	1	adj n pro:per	0		

Fig. 2. Calculations of Overlapping Syntactic Trigrams (Aligned Tokens) in the Conversation between Participants ST024 and ST121 on the Spot-the-Difference Task 'Shiny balls'.

Table 1
Descriptive statistics for lexical and syntactic types and tokens distinguishing pairs and task types for all participants (N = 58).

	Lexical *Mean (SD)*		Syntactic *Mean (SD)*	
	Tokens	Types	Tokens	Types
Real pairs	3.45 (2.68)	1.37 (1.04)	35.39 (21.51)	9.91 (4.93)
Random pairs	1.56 (1.36)	0.67 (0.60)	25.76 (13.63)	7.45 (3.10)
Free conversation tasks (real pairs only)	2.52 (2.21)	1.00 (0.83)	41.76 (28.22)	10.92 (6.32)
Spot-the-Difference tasks (real pairs only)	3.90 (2.77)	1.55 (1.09)	32.34 (16.72)	9.43 (4.04)

Table 2
Inferential statistics.

	df	SS	F	P	η^2	Power
Pair (Real vs. Random)	1	1919	44.26	<0.001	0.021	1
Syntactic vs. Lexical	1	38345	884	<0.001	0.420	1
Type vs. Token	1	16025	370	<0.001	0.176	1
Task (Free vs. StD)	1	17	0.399	0.528	0	0.097
Residuals	448	19422	–	–	–	–

In response to the third research question, investigating task type differences, the descriptives indicate that Spot-the-Difference tasks seem to yield higher lexical alignment, while free conversation tasks exhibit high syntactic (token) scores, yet, the factor task did not return a significant main effect, nor did the interaction between task type and type-token (Free conversation vs. Spot-the-Difference: $F(1,17) = 0.399$, $p = .528$ – cf., Table 2).The boxplots in Fig. 3 visualize the aforementioned differences per variable and task type (N.B. the difference in scale between the two boxplots).

Follow-up ANOVAs on separate datasets per variable further looked into pair and task type effects (cf., Table 3). Accordingly, the pair factor (real vs. random) significantly distinguishes groups on all variables, while task type (Free vs. StD) is only significant for lexical, but not for syntactic alignment scores. Pair × task interactions yielded significant results for syntactic tokens only.

For lexical tokens, Tukey post-hoc analyses indicated that real pairs ($M_{Lex\_tokens\_real} = 3.45$, $SD = 2.68$) showed significantly more alignment than random pairs ($M_{Lex\_tokens\_random} = 1.56$, $SD = 1.36$, $p = 0$; *95% CI* [1.337, 2.330]), and Spot-the-Difference tasks ($M_{Lex\_tokens\_StD} = 3.90$, $SD = 2.77$) showed more alignment than free conversations ($M_{Lex\_tokens\_free} = 2.52$, $SD = 2.21$; $p < .001$; *95% CI* [0.732, 1.725]). Similarly, Tukey post-hoc analyses revealed for lexical types that real pairs ($M_{Lex\_types\_real} = 1.37$, $SD = 1.04$) aligned more than random pairs ($M_{Lex\_types\_random} = 0.67$, $SD = 0.60$; $p < .001$; *95% CI* [0.497, 0.875]), and Spot-the-Difference tasks ($M_{Lex\_types\_StD} = 1.55$, $SD = 1.09$) elicited more alignment than free conversations ($M_{Lex\_types\_free} = 1.00$, $SD = 0.83$; $p < .001$; *95% CI* [0.323, 0.702]).

For syntactic tokens, Tukey post-hoc analyses revealed that real pairs ($M_{Synt\_tokens\_real} = 35.39$, $SD = 21.51$) aligned significantly more than random pairs ($M_{Synt\_tokens\_random} = 25.76$, SD = 13.63; $p < .001$; *95% CI* [6.374, 15.789]) but task differences were not significant despite descriptives showing more alignment in free conversation ($M_{Synt\_tokens\_free} = 41.76$, $SD = 28.22$) than in Spot-the-Difference tasks ($M_{Synt\_tokens\_StD} = 32.34$, $SD = 16.72$; $p = .225$; *95% CI* [−7.607, 1.809]). Syntactic types mirrored this picture, with real pairs ($M_{Synt\_types\_real} = 9.91$, $SD = 4.93$) yielding higher scores than random pairs ($M_{Synt\_types\_random} = 7.45$, $SD = 3.10$; $p < .001$; *95% CI* [2.667, 1.653]) while no significant differences emerged between free conversations ($M_{Synt\_types\_free} = 10.9$, $SD = 6.32$) and Spot-the-Difference tasks ($M_{Synt\_types\_StD} = 9.43$, $SD = 4.04$; $p = .451$; *95% CI* [−1.401, 0.627]).

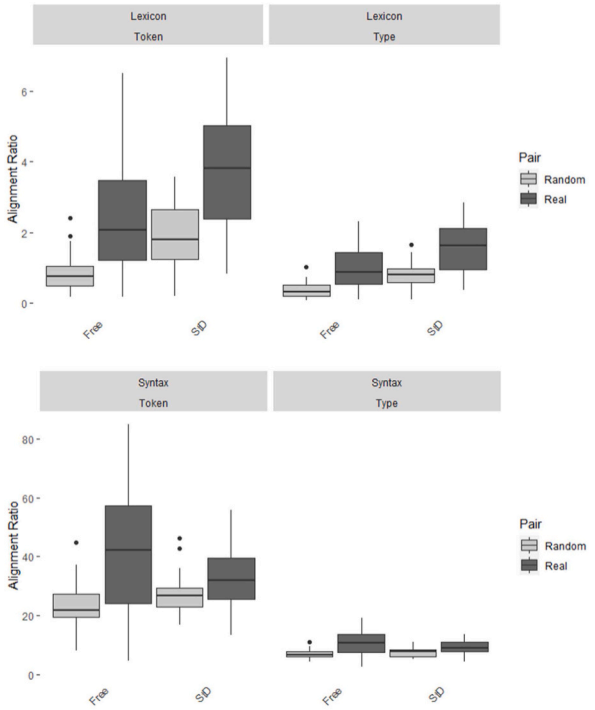


Fig. 3. Boxplots for Lexical and Syntactic Alignment (Tokens and Types) Split for Real vs. Random Pairs in Free Conversation vs. Spot-the-Difference Tasks.

Table 3
Detailed inferential statistics on averaged data.

	df	SS	F	P	η^2	Power
Lexical Tokens						
Pair (Real vs. Random)	1	97.5	53.55	<0.001	0.282	1
Task (Free vs. StD)	1	43.76	24.03	<0.001	0.126	0.998
Pair x Task	1	0.8	0.439	0.509	0.002	0.102
Residuals	112	203				
Lexical Types						
Pair (Real vs. Random)	1	13.65	51.5	<0.001	0.268	1
Task (Free vs. StD)	1	7.623	28.77	<0.001	0.149	1
Pair x Task	1	0.051	0.192	0.662	0.001	0.072
Residuals	112	29.68				
Syntactic Tokens						
Pair (Real vs. Random)	1	3561	21.75	<0.001	0.156	0.997
Task (Free vs. StD)	1	244	1.49	0.225	0.011	0.231
Pair x Task	1	757	4.622	0.034	0.033	0.576
Residuals	112	18337				
Syntactic Types						
Pair (Real vs. Random)	1	206	27.16	<0.001	0.191	0.999
Task (Free vs. StD)	1	4.3	0.572	0.451	0.004	0.118
Pair x Task	1	20.1	2.644	0.107	0.019	0.37
Residuals	112	850				

5. Discussion

The present study sought to explore lexical and syntactic alignment as well as task effects in English-Spanish teletandem conversations. Data of 29 mixed-language pairs engaging in two free conversations (Questions and Wrap-up) as well as four Spot-the-Difference tasks were scrutinized for alignment combining PoS-tagging and n-gram analyses. Comparing alignment scores in conversations of real pairs and created conversations of randomly paired interactions of participants allowed us to distinguish conversational alignment from coincidental overlap.

5.1. Alignment in teletandem conversations

Our first research question, to what extent L1-L2 teletandem partners align their language during video-based oral interaction, can be answered with the observation that about 35% of the syntactic tokens and about 3.5% of exact lexical tokens are repeated by teletandem partners in conversation. Despite the small effect size, the finding is consistent across alignment type (syntactic and lexical) and is substantially higher than coincidental overlap in random pairs would suggest (26% and 1.6% for syntactic and lexical tokens respectively). The figures for alignment of syntactic and lexical types (9.9% and 1.4% respectively) are also higher than the respective numbers for random pairs. Therefore, we argue that our data allow for the interpretation that the found overlap between speakers in a conversation is not merely coincidental, but indeed can be related to processes of alignment. Without introspective data (e.g., stimulated recall) or other means to investigate implicit and/or explicit alignment (see, for example, eye-tracking data by Michel & Smith, 2018), there is little researchers can do to ascertain that overlap is based on alignment - in particular in authentic interaction (in contrast to lab-based studies using a confederate). In that sense, we think that our approach comparing real versus random pairs can serve future work as a suitable methodology to address this challenge.

As a whole, our data confirm earlier findings by Michel and Cappellini (2019) that L1-L2 teletandem partners align their language. Our current analysis does not provide insights into differences based on language (i.e., English vs. Spanish) or whether this alignment is due to the L1 speaker accommodating to the contributions of the L2 speaker or whether it is the L2 speaker that picks up language provided by the L1 model.

As Excerpt 1 suggests, it might be more of the former than of the latter. That is, in the conversation between participant 024 (L2 speaker) and 126 (L1 speaker), the L1 speaker draws on the wording by the L2 learner and repeats it with a recast. Partial alignment to 'is the same way' is correctly repeated as 'it's the same', which seems an instance of conscious alignment plus correction by the L1 partner. The excerpt also shows that, due to self-repetition, some of the alignment scores might be indicative of within-speaker alignment rather than between speaker alignment. Again, this pattern has been found before in teletandem data (Michel & Cappellini, 2019) as well as in task-based oral interaction (Dao et al., 2018). At the syntactic level, alignment can include partial pick-up of lexical forms too (cf. Excerpt 1). In the conversation of participant 004 (L2 speaker) and participant 104 (L1 speaker), both use the PoS-trigram Subject-Modal-Verb ('I/you can see') including partial overlap of the lexical chunk 'can see'. So far, both examples show how the L1 speaker uses language of the L2 partner - a pattern that is in line with findings by Cappellini et al. (2022, this issue), who found more instances of L1 speakers aligning to their L2 partner in teletandem exchanges than vice versa. Future research will need to investigate this in more detail. Similarly, the differences of within- vs. between-speaker alignment in teletandem exchanges, considering possible differences in matrix language, will need to be explored in follow-up studies.

Answering our second research question, which addressed the differences between alignment at lexical and syntactic level as measured by tokens and types, we replicated the findings by Michel and Cappellini (2019) as syntactic alignment is more prominent than exact lexical overlap. To a certain extent, this finding is not surprising because naturally there are more syntactic tokens to align to than lexical phrases, which often are single lexical types. Indeed, the data show that exact lexical overlap, investigated by Michel and O'Rourke (2019), is limited to a few types (around 1.4%). Yet, these figures are still higher than would happen randomly (not even 1%). As could be expected, we found that there is always more alignment at token than at type level, implying that each syntactic and lexical structure introduced into a conversation is repeated several times. Token/type ratios suggest that lexical trigrams are re-used on average about 2.5 times, while syntactic structures are repeated around 3.5 times in a conversation - again supporting the initial finding that structure-based syntactic alignment is more prominent than lexical overlap. Large differences exist between specific

Examples of Alignment in L1-L2 Interactions

Participant 024 - L2	I can see six different, eh, nine, I don't know, *balloons.*
Participant 126 - L1	Yes, *balloons* is the word, good word.
Participant 024 - L2	with different colours, there are on the top there are first one green then one blue and at the top right there's a red *balloon.*
Participant 126 - L1	Okay, yes, I have that too, yes.
Participant 024 - L2	I think in your photo is the same way?
Participant 126 - L1	It's the same, it's the same.
Participant 004 - L2	okay, I can see, eh, nine *circles*.
Participant 104 - L1	good, very good, yes.
	...
Participant 004 - L2	but I, I don't see difference.
Participant 104 - L1	no, well, my *circles* are very shiny, and shiny and bright.
Participant 004 - L2	yes, eh.
Participant 104 - L1	and, can you see, reflected in the *circles*, you can see the squares reflected.

Excerpt 1. Examples of alignment in L1-L2 interactions.

structures (e.g., PREP-DET-NOUN-trigrams were repeated more frequently than others), and between pairs (e.g., the conversation between 002 and 102 yielded high alignment scores on all four measures). Future work will be able to shed more light on the reasons behind such differences. Despite the fact that task-based interaction expects speakers to use their own language resources (Skehan, 2018) and that there are many different linguistic ways to express what partners were expected to discuss, it remains remarkable that pairs seem to agree fairly quickly on their linguistic choices even pertaining to exact lexical overlap.

5.2. Task effects on alignment

Providing an answer to our third research question on how alignment might differ depending on task type, our study showed that task effects were prominent for lexical but not for syntactic alignment. That is, Spot-the-Difference tasks yielded significantly more aligned lexical trigrams at the token and type level than free conversations. Our findings are in line with Dao et al. (2018), who reported that alignment was affected by task type. An explanation for these task differences might be the specific tasks pairs worked on, as well as the teletandem set-up. For an effective completion of a Spot-the-Difference task, it is essential that conversational partners quickly align on their mental models which is enhanced by aligning at the linguistic level (Pickering & Garrod, 2021). Earlier L1 work has shown that lexical alignment can be a conscious decision based on beliefs about a partner's linguistic capabilities (Braningan, Pickering, Pearson, McLean, & Brown, 2011). In an L2 conversation, it might be natural for the L2 speaker to copy the L1 model on how to call things. In our data, we have however also seen the opposite, that is, the L1 speaker following the L2 speaker's choice. For example, in task 3, participants were comparing pictures with several coloured balls (cf. Appendix). In Excerpt 1, participant 024, an L2 speaker of English, introduces the word 'balloons', which was adopted by their L1 English partner 126. Similarly, the L2 English-speaking participant 004 called the target objects 'circles' which was reused in the remainder of the conversation by their partner 104, an L1 speaker of English. Naturally, talking about the same objects increases the amount of overlap (in random pairs, the average score of lexical overlap is almost 2, cf. score in Fig. 3), but agreeing on and aligning to a specific lexical trigram presumably meant that pairs could work towards task completion more effectively. This phenomenon might be explained by the fact that L1 speakers are more flexible in their linguistic choices and therefore have the capacity to adapt to the L2 partner than the other way round. It will be exciting to explore this hypothesis in future work.

In contrast, the free conversation tasks required less agreement on how to call objects and/or concepts. The starting conversation served as a getting-to-know-each-other task by asking and answering questions (e.g., Why did you decide to study Spanish?). Pairs decided themselves how to use the two languages to complete that task. Some did part of the questions in Spanish before switching to English and vice versa. Some pairs used intercomprehension, each speaking in their L2, others did a back-and-forth mix of translanguaging. Although earlier work has shown that priming also takes place cross-linguistically (Kootstra & Muysken, 2017), it is likely that alignment in mixed-language conversations was lower than in the Spot-the-Difference tasks where the language of conversation was given.

A further reason explaining the task differences could be the open nature of the task. That is, the goal of Spot-the-Difference tasks was clear, and successful task completion elicited alignment. In contrast, the free conversations, although guided by questions, were still free in nature. It might be that syntactic alignment being more pronounced in the free conversations than during the picture-based task is related to the fact that during the Spot-the-Difference tasks partners were focused on an image. In the free conversations, participants could (in principle) attend to their partner since there is no image competing for attention.

Yet, given that these were L2 conversations (as defined by Costa et al., 2008) presumably meant that the L2 speaker was not always able to align to their partner, most likely because of the limitations of their still developing linguistic repertoire. Indeed, Excerpt 2 shows a breakdown of communication, where the L1 speaker (participant 102) answers the first question ('Why did you study Spanish?') asked by the L2 speaker (participant 002) by also answering the second question ('Do you like Spanish?'). Nonetheless, participant 002 asks the question in the following turn and responds twice with 'Perfect', not relating to the contribution of their

Example of Breakdown of Communication

Participant 002 - L2	Ah, perfect. The second question was, what can, no, eh, no, *why did you study Spanish*?
Participant 102 - L1	Because I have Spanish cousins. They live in Madrid and, I really like the language. I'm not very good at Spanish but I do like it. So I wanted to keep it up. So I'd like to live in Spain for a year or something like that.
Participant 002 - L2	Ah, perfect.
Participant 102 - L1	Yeah.
Participant 002 - L2	And then, *do you like Spanish*?
Participant 102 - L1	Yeah, I love it, but I'm not good at it. I'm really not that good at it. I am okay at writing and reading but I'm not good at talking in Spanish at all.
Participant 002 - L2	Perfect. I think somebody have to check this. Is this recording?

Excerpt 2. Example of breakdown of communication.

partner and changing the topic. In such cases, it is unsurprising that no alignment at the linguistic level is taking place as the situational model seems not to be aligned either (Pickering & Garrod, 2021).

Finally, there might be a difference between the two phases of the free conversation tasks. It seems that more alignment took place during the warm-up phase, guided by questions, than during the final wrap-up following the Spot-the-Difference tasks. Some pairs left the video-call immediately after the final StD task with a comment such as 'We're done!', while others were well engaged with each other and continued the conversation on topics of their interest. Consequently, individual differences of participants and of pairs being more or less interested in each other are likely to have influenced the amount of talk and consequently also the alignment with each other (Akiyama, 2017). Future research will need to address these aspects of alignment during video-based oral teletandem interaction in more detail.

5.3. Limitations

We are aware of several limitations of our work of which we will highlight the following. We have worked with two different datasets from 2008 to 2020. Although no substantial differences were apparent in the task performances between these data sets, participants from 2020 talked more in the free conversations (initial questions and wrap-up) than the 2008 participants - with accordingly higher alignment scores for the 2020 data. A reason might be that in 2020 participants had been used to video-based conversations due to the digital turn following the Covid-19 pandemic. The greater familiarity with digitally-mediated conversations could have resulted in more natural conversations in 2020 than 2008, when video-based teletandem might have affected participants' ease and comfort. As all measures were averaged over years, this is unlikely to have affected our results, yet, it remains an interesting research question for the future.

Furthermore, due to time and space restrictions, the current analyses did not distinguish between languages and/or within- vs. between-speaker alignment. Similarly, we did not focus on who was aligning to who (i.e., L1 to L2 speaker or vice versa). Other contributions to the special issue show that different languages elicit different types of alignment (e.g., different lexical and syntactic structures as well as multimodal instances of alignment, cf. Cappellini et al., 2022, this issue). Furthermore, even though participants were all working towards the B2 level in their target language, the L2 English proficiency of Spanish learners was generally higher than the L2 Spanish proficiency of English learners. Earlier work suggests that alignment is influenced by proficiency as well as perceived competence of the interlocutor and future research will need to address these aspects in L2 alignment.

6. Pedagogical implications

Based on the current investigation, we can formulate some implications for language pedagogy and teletandem exchanges. To the best of our knowledge, alignment is rarely considered in the design of language teaching material. Continuation tasks used in writing pedagogy form an exception (cf. Wang, Gan, & Boland, 2022, this issue). Together with earlier work in the field (e.g., Trofimovich & McDonough, 2011) and the papers gathered in this special issue, we provide evidence that alignment is an important factor affecting interactive performances. Therefore, it seems essential to draw on concepts of alignment in language pedagogy.

Specifically, our data suggest that different tasks elicit different types and different amounts of alignment. More guided tasks (e.g., Spot-the-Difference) seem to foster lexical alignment of task-natural forms. Therefore, they might be ideal to support the learning of specific vocabulary items that are naturally elicited and repeated during task-based interactions, as alignment supports efficient task completion. In contrast, more open tasks like our free conversations seem to be more prone to differences between individual participants (e.g., language proficiency) and of interacting pairs (e.g., engagement with their peer).

These findings are particularly interesting for teletandem exchanges, which have the goal to enhance out-of-school exposure. Our results suggest that while alignment is always present in teletandem exchanges, targeted task-design building on alignment research insights could increase its effectiveness. Typically, information exchange tasks are more often used in teletandem in detriment of language-focused tasks (Akiyama & Cunningham, 2018). Our study provides evidence that the inclusion of the latter potentially elicits higher lexical alignment with its beneficial effects on vocabulary acquisition. Furthermore, the data suggest that accommodation from the L1 speaker to the L2 learner (instead of copying by the L2 learner from the L1 model) might be a prominent pattern. Our current study gives ideas for task design that can be used to train task-specific vocabulary. Earlier, Kim et al. (2019) and Michel and Stiefenhöfer (2019) have created examples of tasks that are designed to elicit syntactic target features (e.g., subjunctive mood or word order in subordinate clauses). Future investigations will enlarge the set of focused tasks that draw on alignment as a pedagogic tool. Most importantly, in this paper we provide evidence that alignment is an important criterion to consider for task design.

7. Conclusion

The current study investigates alignment in oral video-based teletandem interactions. The findings provide robust evidence that alignment is an important aspect of task-based performances in this type of L1-L2 speaker conversations affecting the use of both lexical and syntactic structures across languages. Furthermore, we have shown that Spot-the-Difference tasks can serve as an excellent pedagogical tool to elicit and frequently re-use task-specific vocabulary, which potentially supports language learning (Tyler and Ortega, 2016). Not least, we present a novel methodology by comparing alignment scores in real versus random pairs, which will allow future research to identify alignment and discriminate it from coincidental overlap in authentic conversations.

Author statement

Marije Michel as the first author of this paper has conceptualized and supervised the project as a whole and written its main parts with exception of the methods and results section.

Christine Appel, as the second author, has conceptualized and supervised the project, designed the tasks, provided access to participants and data and contributed in parts to the body text and provided extensive feedback in all phases of the study.

Saioa Cipitria, as third author, has collected, coded and analysed the data and written the methods and results section. She also contributed to other parts of the text and provided feedback to the manuscript.

Appendix

Tasks

Example Free Conversation Task: 0_Questions

Student A

For this task you will have to describe some pictures and identify the differences with the pictures your tandem partner can see. Before you start with the picture activity find out more about your tandem partner. Write down the answers to the following questions and send them to your teacher:

- What degree does s/he study?
- How long has s/he been studying Spanish?
- Where does s/he live?
- Is it the first time s/he uses Skype?

When you are done click on the link below to start the picture task (read carefully the instructions):

Picture Task 1

Student B

Para esta tarea tendrás que describir unas imágenes e identificar las diferencias en las imágenes que tu pareja de tándem ve. Antes de empezar con esta tarea obtén información sobre tu pareja de tándem. Escribe las respuestas de las siguientes preguntas y envíalas a tu profesor/a.

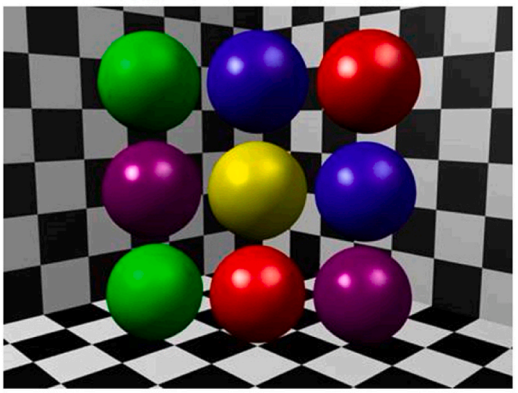
- ¿Qué licenciatura estudia?
- ¿Por qué estudia inglés? ¿Le gusta estudiar inglés?
- ¿Qué puede contarte sobre su universidad?
- ¿Dónde vive?

Cuando estés listo haz clic sobre el siguiente enlace para empezar con la tarea de las imágenes (lee detenidamente las instrucciones):

Tarea 1

Example Spot-the-Difference Task: 3_Shinyballs

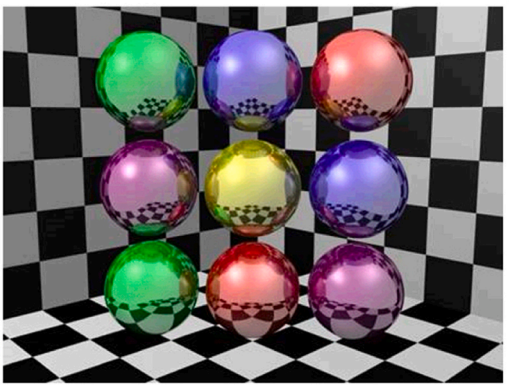
Student A



Discuss the picture on the left in **English** and find **ONE** difference.

» Next picture

Student B



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