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Enhancing Language Education through Social Robots: a Study on Robot Literacy and the Use of Oral Communication Strategies in L2

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Abstract:

This article explores the long-term child-robot interaction (CRI) in the context of robot-assisted language learning (RALL). More specifically, we examined how robot literacy, the ability to have appropriate relations and interactions with a robot, manifested itself in the use of L2 communication strategies in French as a second language (L2). Our primary research question centres on the role of familiarity with the robot and the development of robot literacy through engagement in L2 interaction. We compared the experiences of fourth graders who had interacted with a social robot over a prolonged period with fifth graders without such experience. A usage-based approach to examine L2 oral communication strategies, including conversation management, was employed. The findings revealed that robot literacy positively impacted learners' willingness to communicate with the robot and their L2 interactional skills. This improved their communication strategies, and understanding of language structures. Unlike previous studies emphasizing the positive impact of novelty in RALL, this study suggests that long-term familiarity might, in fact, benefit the learners more in a one-on-one setting. The research underscores the importance of robot literacy and familiarity in shaping effective engagement and language development outcomes. It contributes to the CRI discourse and highlights the intertwined relationship between technology, education, and societal progress. Overall, the study posits that enhancing robot literacy equips learners with skills to navigate the evolving technological landscape, fostering social and linguistic sustainability.'

Keywords: Child-Robot Interaction, Robot-Assisted Language Learning, Robot Literacy, L2 Communication Strategies, Social and Linguistic Sustainability

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1 Introduction

The integration of social robots in language learning has not only transformed the learning experiences but also opened up new possibilities for accessibility and equality in education. In a society where language skills are integral to both self-expression and participation, providing accessible language education is a critical concern (Kyckling et al., 2019). In this context, social robots can play a transformative role in shaping the future of mainstream language education, where there are several language education related challenges (Veivo et al., 2023). These robots, whether fully independent or partially autonomous, mimic human-human interactions utilizing nonverbal cues and multimodal communication while adhering to pre-programmed behavioral norms (Ahtinen & Kaipainen, 2020; Jakonen et al., 2024; Randall, 2019; van den Berghe et al., 2019). They are capable of fostering engaging learning environments that emphasize oral interactions in a multimodal setting. However, the successful implementation of a robot in a language learning context also requires new skills from the learners, as we will discuss in this article.

Social sustainability entails ensuring equal opportunities, fair treatment, and access to resources and services for all individuals (Maijala et al., 2024). Social robots provide a non-judgmental and engaging learning environment, which can be particularly beneficial. (Peura et al., 2023). By avoiding human biases, they create an impartial and informal space for expression. Moreover, social robots, by supporting multiple languages, can help prevent schools from becoming monolingual environments. This is particularly relevant in light of the findings of Alemi and Haeri (2020), which underscore the effectiveness of robot-assisted instruction in L2 pragmatics. In today's society, children are increasingly interacting with AI and robotics. As such, robot literacy can be considered an integral part of future language proficiency, contributing to social sustainability from a linguistic perspective.

Research on child-robot interaction (CRI) has investigated emotional bonds, engagement patterns, and robot acceptance within this interaction paradigm (Belpaeme et al., 2012; Chen et al., 2023; van Straten et al., 2020). These interactions significantly influence language acquisition, especially among children who show a keen interest in interacting with robots (Belpaeme et al., 2018; Randall, 2019). However, questions remain about the long-term impact of robots on language learning motivation (Randall, 2019; van den Berghe et al., 2019). While the novelty effect initially enhances learning outcomes, its sustained influence is uncertain, potentially diminishing over time as individuals become accustomed to robot interactions (Randall, 2019).

Building on this understanding of the role of social robots in second language (L2) learning, it is important to consider the competencies that underpin effective communication in L2. The Common European Framework of Reference for Languages (CEFR) offers a comprehensive approach to defining communicative competence, categorising it into four competencies, each with its own descriptors and scales (Council of Europe, 2020. However, Doehler (2019) provides a more nuanced perspective, focusing on interactional competence as a dynamic ability that evolves through individuals' accumulated experiences of social interactions. The focus on interactional competence resonates with the role of social robots in fostering engaging and non-judgmental learning environments producing robot literacy.

Robot literacy, as defined by Suto (2013), involves establishing appropriate relationships with intelligent robots and adding an embodied dimension to digital literacy. It includes understanding, interacting with, and critically evaluating robots in the evolving technological landscape. In the context of robot-assisted language learning (RALL), learners' familiarity with interacting with robots and understanding their dual role as an active participant and a functional tool are crucial to enhancing questioning, problem-solving, language awareness, and social interaction skills (Peura et al., 2023). Moreover, the willingness to communicate (WTC) is a key factor influenced by communication apprehension and speech anxiety (MacIntyre & Doucette, 2010). Recent studies have shown that increased anxiety often leads to decreased WTC (MacIntyre & McGillivray, 2023). It is to note that willingness to speak may or may not turn into behaviour and actual spoken outcome. The use of social robots in RALL has the potential to enhance motivation and reduce anxiety in L2 speaking, (Alemi et al., 2015; Lee & Lee, 2022; Randall, 2019; Peura & Johansson, 2023). However, qualitative studies in naturalistic settings are needed (Ahtinen & Kaipainen, 2020; Deng et al., 2019; Lee & Lee, 2022; Woo et al., 2021).

Expanding previous research on RALL that is focused on oral competencies (Lin et al., 2022), this study investigated how young learners' robot literacy impacts their WTC and language anxiety and thus their communicative competence in RALL. Acknowledging the challenges in speech recognition (Engwall & Lopes, 2022; van den Berghe et al., 2019), this study emphasises readiness to communicate, interactional skills, and oral communication strategies in French as a L2. This study uncovered problem-solving mechanisms within one-on-one CRI settings, particularly when the robot, operating with pre-scripted responses, rejected initial responses because of a lack of human-like responsiveness.

In this study, we adopted an ecological perspective (van Lier 2004) to explore how learning manifests. In line with the usage-based language learning approach, the robot was programmed to carry out brief conversations, providing learners with authentic-like examples in real-world contexts at their skill level. Moreover, it is important to consider that in the Finnish educational context, English is the predominant foreign language taught (Finnish National Agency for Education, 2019; Veivo et al., 2023; Vipunen, 2024a). French is perceived as a less-taught language. Unlike English, which is present in pupils' daily lives, both inside and outside the school, French is rarely heard outside of the classroom. Therefore, our study sheds light on L2 learning in a unique context promoting equal language opportunities in education. We aimed to bridge the aforementioned research gaps in understanding the interplay between the novelty effect and motivation in speaking and how they are affected by robot literacy competences.

The research questions that guided this study were:

1. How does robot literacy affect the frequency and quality of communication in the L2?
2. How does robot literacy affect the frequency and repertoire of communication strategies used by primary school children?

By investigating how sustained exposure to robots influences these factors over time, this study aimed to provide insights into optimizing RALL interventions for language learners. The study not only adds to the discourse on CRI but also emphasizes the significance of robot literacy in shaping effective engagement and learning outcomes in L2 as well as providing tools for navigating an AI-assisted social reality. In doing so, it contributes to the broader goal of promoting linguistic and social sustainability in language education.

2 Previous works

2.1 The role and impact of robot interaction settings on learning outcomes

Research has demonstrated that robots can positively impact language learning, especially word learning (Lee & Lee, 2022; Randall, 2019). van der Berghe et al. (2021) found that learners showed initial positive outcomes when introduced to robots, but these effects diminished in long-term studies, which suggests that the initial boost in learning may be due to the novelty of the technology. They advocated for longer-term research to validate these results and suggested that RALL may be more beneficial for certain children, underscoring the role of individual characteristics in its effectiveness in word learning.

However, the impact of robots on oral competence is less understood and studies have yielded mixed results. A study by Rosenthal-von der Pütten et al. (2016) showed that adults did not modify their language to align with the speech patterns of robots or computer systems, which suggests a potential disconnect in implicit learning mechanisms, possibly due to the perceived quality of the speech system. Research on this alignment among children is limited, indicating a need for further studies to assess various aspects of speaking skills and determine which areas gain the most from robot tutoring (Lee & Lee, 2022; van den Berghe et al., 2019).

In a systematic review of oral interactions in RALL, Lin et al. (2022) found that the interactive oral task design in RALL, which involves robots, human facilitators, and learners, significantly improved academic achievement, which was attributed to an increase in the learners' concentration. Another meta-analysis (Lee & Lee, 2022) emphasised that social robots generally yield enhanced learning outcomes in one-on-one interactions. This concentrated practice benefits individual learners, although it may overlook collaborative aspects.

Different robot behaviours such as interviewer, narrator, facilitator, and interlocutor were examined by Engwall and Lopes (2022) during language learning sessions that resembled language café scenarios among adults. Their study highlighted the significance of the robot adopting the role of an interviewer for effective learning in RALL: the learners showed the most positive response when the robot concentrated on interviewing each learner individually. However, they were most engaged during sessions where the robot fostered interaction among the learners themselves. For pre-school learners, the robot's role as a teacher assistant in instructional language pragmatics has been found beneficial (Alemi & Haeri, 2020).

However, many studies have underscored speech recognition challenges in RALL, particularly with children as participants (Lin et al., 2022). The unique errors made by language learners amplify these challenges, necessitating a blend of technological and human interventions and highlighting the importance of peer learners and teachers in interactional sequences (Engwall et al., 2021). In such instances, learners with a grasp of robot literacy are better equipped to understand when these challenges arise (Peura et al., 2023; Peura & Johansson, 2023).

Given these benefits and challenges, it is crucial to examine the communication behaviour and strategies that learners use when interacting with robots. This study sheds light on the adaptive oral communication strategies used by young learners in French as their L2, particularly in one-on-one interactions when communication with the robot breaks down. This perspective deepens our understanding of CRI without the guidance of human facilitators.

2.2 Affective and situational factors that influence RALL

Research highlights the influence of emotions, particularly anxiety and enjoyment, on SLA (Boudreau et al., 2018; Lee, 2016). Anxiety, arising from various factors, interacts with individual differences such as personality traits and motivation in language learning (MacIntyre & Gardner, 1989). Language anxiety, contextualised within specific learning environments, significantly shapes learners' WTC.

When transitioning from emotional to situational factors, it is important to consider the aspects that shape individuals' interactions. Factors such as familiarity with the interlocutor and the nature of the task impact WTC (Pawlak et al., 2016). Effective instructional interventions that target emotional factors such as language anxiety can enhance WTC (Mesgarshahr & Abdollahzadeh, 2014). Like language anxiety, WTC is influenced by both stable traits and situational states, including language-related anxieties and perceived competence (Peng, 2022). However, unsuccessful encounters with social robots can lead individuals to reach thresholds of frustration, potentially halting their interactions with such systems, as demonstrated by Matsui et al. (2021) with virtual AI agents. By contrast, within RALL environments, children demonstrate sustained engagement with social robots, and challenges are effectively addressed with classmates' or the teacher's assistance resulting in successful communication (Peura et al., 2023; Maijala & Mutta, 2023).

Previous studies have underscored the positive impact of RALL through reducing learners' anxiety levels and enhancing their motivation and engagement (Alemi et al., 2015; Lee & Lee, 2022). This is often attributed to the novelty effect, which refers to the heightened enthusiasm and engagement that learners often exhibit when first interacting with robots (Kanda et al., 2004). However, this initial excitement tends to wane as learners become more accustomed to technology (Randall, 2019). Despite the positive short-term effects of this novelty, its long-term impact on the acquisition of speaking skills remains unclear (van den Berghe et al., 2019).

The findings of Alemi et al. (2015) provide empirical support for affective and situational factors, demonstrating the potential of RALL in enhancing student participation. Students generally hold a positive attitude towards robots in the classroom, fostering a joyful learning atmosphere and enhancing student participation. This reduction in anxiety, coupled with increased motivation facilitates more efficient language acquisition (Randall, 2019).

Given the limited communication opportunities in French for young learners in Finland, especially outside the language classroom, their WTC in French is largely restricted to interactions within the school environment. This highlights the role of a social robot in supporting the linguistic variety and equity in education, thereby supporting the sustainability of language learning and usage in line with the Agenda 2030 goals (UNESCO, 2021)1. Aligning with MacIntyre et al.'s (1998, page 547) definition of WTC as the 'readiness to enter into discourse at a particular time with specific persons, using L2', this specific study context indicates the extent to which an L2 learner is inclined to engage in interactions with the robot at school. As mentioned above, an intention so speak may not always turn into behavior.

2.3 Applying interactional competencies in RALL

The CEFR outlines language activities and strategies across four modes of communication: reception, production, interaction, and mediation (Council of Europe, 2020). Among these, it recognises the significance of learners' repair strategies in successful communication, particularly in oral production. Specifically, at the B1 level, typically achieved in high school, learners are expected to flexibly use relevant repair strategies to address issues in their own utterances and those of others in their conversation. However, the CEFR lacks detailed descriptors for these strategies at lower levels, such as those typically achieved at the primary school level.

While the CEFR views communicative competence as an individual's cognitive property, Doehler (2019) emphasises the social dynamics of interaction, suggesting that interactional competence is continuously refined during these interactions. This study aligns with Doehler's view that interactional competence is an aspect of language use that emerges through social interaction and that it is 'shaped in ways that can be understood, attended to, and accepted' by other participants in the conversation (Doehler, 2019, p. 30). It is not just about knowing the rules of a language but also about being able to use the language effectively in interactions by adapting to the dynamics of the situation. This

1. For more detail of the 17 sustainable development goals, see also https://kestavakehitys.fi/en/agenda2030.

view supports the use of communication strategies as essential tools for learners. They help navigate language challenges and improve effectiveness (Council of Europe, 2020). They aid in managing communication tasks and compensating for language deficiencies (Mesgarshahr & Abdollahzadeh, 2014). This, in turn, helps learners to overcome their apprehension towards communication in L2 and increases their readiness to communicate whenever the opportunity arises (MacIntyre & Doucette, 2010). Examining how participants adapt their oral communication strategies in this new context sheds light on how young learners navigate the initial conversational flow and manage any breakdowns or repairs in communication with the robot.

Building on the CEFR's action-oriented approach (Piccardo & North, 2019), our study emphasises the importance of meaningful interactions in language learning. This is reflected in the design of learning tasks in RALL, which aims to utilise the new affordance of a robot to facilitate oral interactions in language classrooms, creating engaging and meaningful learning experiences (Lin et al., 2022) in which learners acquire language through actual language use in social interactions, rather than just memorising rules and vocabulary.

The use of conversation analysis tools in the study of social robots, as highlighted by Pitsch (2020) and Rollet and Clavel (2020), has offered valuable insights. In this study, we utilised the initiation-response-evaluation (IRE) model, a common classroom interaction pattern originally developed as initiation-response-feedback (IRF) model by Sinclair and Coulthard (Heron & Dippold, 2021).

This model involves an initiator posing a question, a respondent answering the question, and the initiator evaluating the response and thus fits within the setting of our study. In our context, the robot, pre-scripted with questions, assumed the role of a peer learner, initiating questions and providing feedback on the learner's response, thereby furthering the interaction. The IRE model, despite its limitations, was a valuable tool in our research. It offers learners a chance to practice their responses in L2 during oral activities and it enabled us to investigate communication strategies in the RALL context.

3 Methodology

This study is part of a comprehensive empirical research project dedicated to investigating the role of RALL in a L2 (French) classroom in Finland. We examined how learners' interactions evolved over an extended period and compared two groups of young learners. One group had familiarity with the robot and thus gained robot literacy, having experienced a semester-long interaction with robots, and another group was unaccustomed to CRI and lacked robot literacy skills. This latter group only had a brief introductory period before the experimental session. We analysed one-on-one interactions between learners and a pre-scripted robot that responds only to verbal inputs. Although the robot's answers were pre-scripted, the learners could act as mediators of their own learning processes through their answering strategies.

3.1 Tools

In this RALL study, the social robot utilised was Nao 6 (Figure 1), developed by Aldebaran Robotics.

FIGURE 1. Nao 6, named *Dominique*

The robot was introduced to the participants as a new friend named *Dominique* or *Domi* for short, as this is a gender-neutral name in French. The dialogues of the Nao 6 robot were created and programmed by the teacher (one of the researchers) using the Choregraphe programming tool.

The used robot does not rely on the internet but on pre-programmed conversation scripts. Therefore, the robot's interactional behavior is not flexible in real time, and its use of artificial intelligence is limited. Nao does not store any information during teaching sessions, and the only data it sends out to the outside world are the places where it is used. This ensures the careful protection of privacy, but the lack of algorithmic complexity makes it clumsy and might lead to speech recognition problems.

A central theme in our research revolves around investigating how familiarity, as opposed to novelty with the robot, influences WTC as a behaviour in L2 French and the corresponding communication strategies.

We consider robots as new affordances in fostering linguistic sustainability by offering consistent and interactive opportunities for language practice.

3.2 Data and participants

Data were collected during the spring of 2022 at a Finnish primary school, where the primary language of instruction is Finnish. The study involved two groups of participants for comparison: a group of fourth-grade pupils aged 10–11 years (n = 30) who had been working with a social robot throughout the whole spring term (the robot group) and a group of fifth-grade pupils aged 11–12 (n = 23) who had no prior experience with robots (the control group). They were all studying French as their first foreign language (L2) in the same school but with different teachers.

The robot group had been working with the robot as a whole group, in small groups, and in pairs over the course of the semester. During the instructional sessions, the pupils engaged in vocabulary and pronunciation exercises and had brief conversations with the robot, posing questions to it. The robot was introduced to the group as a new mascot and learning companion (Peura & Johansson, 2023).

Strict research ethics and data security protocols were followed throughout the study (Finnish National Board on Research Integrity, 2019). No personal identification information was collected from the children, and all data were anonymised. Participation in the study was voluntary, and the participants had the right to withdraw at any time. Prior to the pupils' involvement, consent for their participation in the study was obtained from their parents. The study received approval to be conducted at the school from the city's education and learning services departent and the school's director. Moreover, the research obtained approval from the ethics committee of the university where the research was conducted.

3.3 Anxiety questionnaire

Considering the inherent anxiety associated with speaking in a foreign language, we employed the Public Speaking Anxiety Scale (PSCAS) to evaluate the anxiety experienced by the participants in the L2 classroom. The PSCAS provides insights into learners' mental reality concerning L2 anxiety within the school environment and evaluates the potential impact of experienced anxiety on the results of our study and the strategies employed during robot interactions. Specifically, we applied the scale developed by Yaikhong and Usaha (2012), which incorporates items from previous scales such as those of McCroskey (1970) and Horwitz (2001), focusing on L2 anxiety. The 18-item applied survey instrument with responses rated from 1 to 5 allowed young learners to respond independently owing to its clear and concise nature (see Appendix 1).

3.4 Conversation with the robot

In the robot session, the pupils engaged in individual conversations in French with the robot for approximately 5 minutes. The social robot ran autonomously without being controlled by the experimenter. The session took place in the school premises without a teacher present (Figure 2).

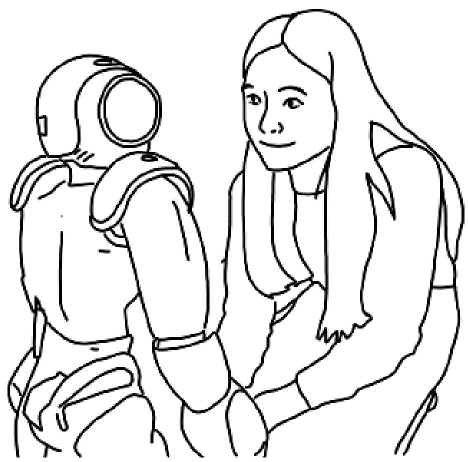

FIGURE 2. A learner in the robot group in a one-on-one interaction with the robot.

The sessions were recorded using two cameras and an audio recorder, supervised by a research assistant. The session was instructed in Finnish (Figure 3). The pupils read the written instructions before participating in the robot session. The same instructions were also available in the testing room next to the robot.

Welcome to your own Domi moment!

Start the conversation by saying "***Bonjour!***" or "***Bonjour Domi!***" This will trigger Domi to activate and respond. The conversation will begin.

Do you dare to give it a try?

Remember, Domi is just a robot. If it doesn't understand you, it might be because of a bug in the robot itself, not necessarily because of your French skills. Don't worry.

Here are a couple more tips:

If you don't understand Domi's question, you can say "***Je ne comprends pas***" (I don't understand) to it.

If you want Domi to move to the next question (or if it keeps repeating the same question), say "***suivant!***" (next!) to it.

Let's see how far you can go. Domi will let you know if and when you reach the end.

Amuse-toi bien! Have fun!

FIGURE 3. Written instructions (originally in Finnish).

The vocabulary and the questions used in the sessions were curated so that both groups were familiar with it through their French learning materials. Prior to implementing the experiment setting with the control group, the researchers conducted pilot robot sessions with the control group to assess the acceptability and feasibility of the intervention. Subsequently, the learners' specific needs were taken into consideration in adjustments for the study setting. Prior to this study, the robot group had been interviewing the robot for their friendship booklet project (Peura & Johansson, 2023). The robot now took the role of an interviewer (see Figure 4).

1. Trigger words by the learner: *Bonjour!* or *Bonjour Domi!*

2. Robot reacts to the learner's greeting: *Bonjour mon ami, ça va ?*

3. Robot reacts to the learner's response either by repeating the question (encouragement to try again), or commenting the learner's response (a sign of a success), e.g.: *Que c'est beau comme nom, j'adore ça.*

4. All in all 24 robot initiated sequences in random order.

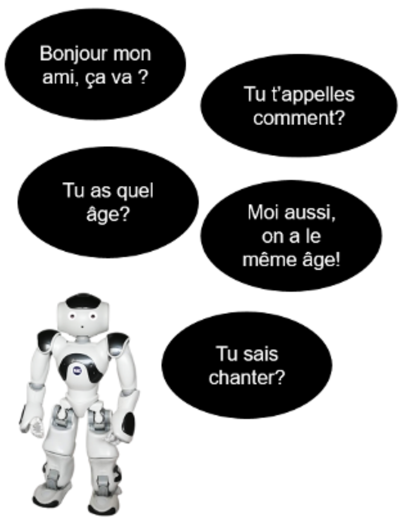

FIGURE 4. Progression of the interaction.

In successful interactions, the learner accurately pronounced a word or provided a correct answer. In such instances, the robot nodded and acknowledged the answer by either providing information related to the question or commenting with a positive remark about the learner's response and moved on to the next question. Conversely, in cases of incorrect pronunciation or incorrect answers, the robot nodded as a signal to continue and encouraged the learner to try again or repeat the question.

3.5 Analysis methods

This study adopted a multimethod approach, integrating PSCAS and utterance frequency. By examining the frequency and nature of responses, we aimed to understand the participants' inclination towards communication without explicitly measuring WTC levels. The IRE model was used to analyse the interactions between learners and a social robot in one-on-one CRI settings (see Table 1). The analysis incorporated both descriptive quantitative techniques and qualitative content analysis of the recorded audio and video files.

TABLE 1. Progression of the data-analysis.

DATA ANALYSIS

Background data:

- PSCAS survey on L2 Anxiety.

Categorization of initiatives and responses:

- Function-based categorization: question bypasses, expressions of non-understanding, response attempts.

Utterance frequency:

- Based on the number of initiatives taken by learners.

Quantitative comparison of initiatives:

- Overall number of initiatives in robot group vs. control group.

Qualitative analysis of the IRE-sequences:

- Examination of robot group learners' attempted answers, problem-solving.

The data collection unit consisted of 50 recorded interaction segments, amounting to 5 hours and 10 minutes of data. The audio data were transcribed and anonymised using the Word Transcribe function. The transcribed Word files were systematically organised into Excel tables for coding. The data set was structured according to key variables such as the learner's gender, age, and group. In addition, the data coding included categories such as the robot's initiatives/questions with and without repetitions, the learner's responses with and without repetitions, and the instructions given to the robot using the guided commands '*Suivant*' (Next) and '*Je ne comprends pas*' (I don't understand). Furthermore, the structured data encompassed single-word responses from the learner and verbal descriptions of the student's correction strategies.

3.5.1 Quantitative analysis

The mean scores of the anxiety questionnaire were calculated for each group and a Student's t-test was performed to investigate whether any significant differences in anxiety levels existed between the two groups. To compare the anxiety levels reported for the question addressing robot interaction, a Wilcoxon rank sum test was performed since the data did not meet the assumptions of equal variance and normality. As to the robot interaction sessions, we annotated and quantified the number of categorised initiatives following the schema described in Table 2.

TABLE 2. Categorisation of the initiatives and responses.

Category	Description
All robot initiatives	Includes all robot-initiated actions, encompassing repetitions of questions and comments (evaluations).
Different robot initiatives	Comprises questions without additional repetitions, aimed at propelling the conversation forward.
All pupil initiatives	Encompasses all learner responses and actions, including repetitions of instructed phrases *Suivant* ("next, please") or *Je ne comprends pas* ("I don't understand.")
Different pupil initiatives	Represents learner responses without additional repetitions, solely comprising the learner's initiatives, answers, and comments in their own words propelling the conversation forward, excluding instructed phrases.
Instructed phrase	*Suivant* ("next please")
Instructed phrase	*Je ne comprends pas* ("I don't understand")

For each participant, the total number of initiatives in each category was counted for statistical analysis. As this data did not meet the assumption of normality, the Wilcoxon rank sum test was used to compare the numbers in each category between the two groups. A Holm-Bonferroni correction (Holm, 1979) was used to account for multiple hypothesis testing. The quantitative analysis was performed in R (R Core Team, 2022).

3.5.2 Qualitative analysis

The qualitative analysis aimed to reveal oral communication strategies to ensure the progressivity of the interaction. The analysis also sought to identify interactional patterns unique to each group in their engagement with the social robot (cf. a cross-sectional method by Kasper and Wagner [2014]). A central focus of the analysis was on the differences in the learners' responses. We examined whether the student answered the robot's question and then identified when the turn was considered accepted (i.e. when the conversation moved forward and switched to the next question). The most typical responses observed were selected as observation units (IRE sequences) and they were transcribed using Jefferson's (2004) and Mondada's (2019) transcription conventions.

To ensure comprehensive consideration, the transcripts of the selected observation units were also reviewed through anonymised videos, taking potential gestures into account, even though the primary focus was not on non-verbal communication. Our qualitative analysis focused on uncovering linguistic interaction differences between the learners in the robot and control groups. It can be assumed that the robot group shared similarities with the control group prior to the implementation of RALL. Consequently, we sought to identify differences in the content of the utterances beyond the instructed phrases by examining how the learners responded when the robot did not accept their initial answers.

4 Results

4.1 Investigating readiness to communicate in L2 and anxiety with PSCAS

Overall, the anxiety level did not significantly differ between the robot group (M = 2.57, SD= 0.46) and the control group (M = 2.57, SD = 0.45); t(51) = 0.04, p = .97. However, we found a discrepancy in self-reported speaking anxiety when interacting with the robot. For the statement '*Minua jännittää/hermostuttaa puhua ranskaa robotin kanssa*' ('I feel nervous speaking French with a robot'), the difference between the robot group (M = 2.17, SD = 1.15) and the control group (M = 2.85, SD = 1.05) was statistically significant according to the Wilcoxon rank sum test, Z = 2.31, p < .05. This suggests that the learners in the control group experienced higher levels of anxiety when speaking French with a robot than those in the robot group.

4.2 Frequency of learner responses and the use of instructed phrases (guided strategies)

The statistical analyses (Table 3) shed light on the frequency of learner responses, providing a deeper understanding of the interaction dynamics between learners and the social robot. The results indicate that the robot group participants employed more diverse strategies.

TABLE 3. The mean number of speech initiatives per category, with standard deviation. The Holm-Bonferroni corrected p values of the Wilcoxon rank sum test are reported.

Category	Robot group, *M* (*SD*)	Control group, *M* (*SD*)	Wilcoxon rank sum test
All robot initiatives	28.5 (11.9)	25.2 (12.8)	*Z* = 1.26, *p* = .51
Different robot initiatives	12.4 (5.51)	10.0 (3.89)	*Z* = –1.34, *p* = .51
All pupil initiatives	31.3 (10.7)	36.3 (10.7)	*Z* = 1.10, *p* = .51
Different pupil initiatives	13.8 (6.58)	8.96 (4.89)	*Z* = –2.95, *p* = .03
"Suivant"	5.08 (3.39)	10.4 (7.00)	*Z* = 2.31, *p* = .02
"Je ne comprends pas"	3.23 (2.07)	4.12 (2.52)	*Z* = 1.55, *p* = .49

As Table 3 demonstrates, no significant difference was found in the total number of responses made by the learners. However, statistically significant differences, highlighted in bold, were observed in the number of different initiatives produced by the pupils, and in the overall use of the *suivant* command. The respective effect sizes were r = 0.39 and r = 0.40, indicating a moderate effect despite the variance in the data.

Such findings suggest that the learners in the robot group utilised the instructed utterances (i.e. guided strategy) significantly less, thus engaging more directly with the robot's questions and trying out their own utterances. By contrast, the interactions in the control were largely driven using the *suivant* command, indicating a tendency to bypass the robot's questions.

Furthermore, the number of different robot initiatives, that is, utterances propelling the interaction forward, was higher for the robot group than for the control group. Although the result is not statistically significant, this indicates that the learners in the robot group progressed further in the conversation, potentially reflecting their adjustment when speaking with the robot. Alternatively, it may signify their ability to navigate the technical challenges presented by the robot, a skill referred to as robot literacy (Peura & Johansson, 2023). Conversely, the learners in the control group, who encountered such challenges for the first time, displayed a lack of robot literacy.

Therefore, we suggest that the difference in readiness to speak in a one-on-one setting was not due to anxiety in speaking the L2. This resulted in a situation-specific anxiety in speaking with the robot. Previous experiences with the robot and robot literacy had a greater impact than the assessed L2 speaking anxiety in the classroom on the willingness to speak with the robot.

4.3 IRE sequences: Oral communication strategies and response patterns

A key observation in this study was the robot's propensity to repeat questions when it did not receive the expected pre-scripted response. As illustrated in Table 3, the learners in the control group tended to rely on a guided strategy, often opting to bypass questions by using the *suivant* command, which prompted the robot to proceed to the next question. By contrast, the robot group exhibited a tendency to employ repair strategies. This behaviour aligns with the descriptors for production strategies, monitoring, and repair as outlined by the CEFR for the B1 level (Council of Europe, 2020). Specifically, the CEFR posits that learners 'can start again using a different tactic when communication breaks down' (Council of Europe, 2020, page 70).

We further examined the individual response strategies employed by the robot learners and the resulting response patterns. Overall, the learners in the robot group demonstrated various strategies to address conversation disruptions and adapt to the robot's behaviour. These strategies included constructing utterances (see Extract 2), mirroring the robot's questions in their responses (Extracts 2 and 3), using discourse particles (Extract 3), adjusting vocal volume, and attempting alternative pronunciations (Extract 4).

Building on the qualitative analysis detailed in Section 3.4.2, we selected the most representative IRE sequences for further analysis. This analysis sheds light on how the learners' communication behaviour and strategies were manifested in their interactions with robots. The IRE model served as a tool in this study, facilitating the examination of these strategies. The results presented in this section provide insights into the patterns and strategies identified in the analysis, illustrating how they emerge in interactions between the learners and the robot.

4.3.1 One-word replies, sentence construction, and mirroring the robot's utterances

Within the control group, the learners frequently opted for brief, one-word replies to the robot's questions, illustrating a succinct response strategy, as demonstrated in Extract 1. This pattern was especially evident when the robot inquired about specific abilities or preferences, such as singing or singer preferences. Here, ROB refers to Dominique, the robot; and LEA, to the learner in CRI.

Extract 1 (control group)

01	**ROB** rob lea	**tu sais chanter? beep ¤*(.) ¤*** *"can you sing?"* ¤reclines back¤ *leans forward*
02	**LEA** lea rob	***¤euh*¤ #(1.3) ¤euh¤(1.5)¤non ¤** *"uhm, no"* *reclines back* ¤leans forward¤ ¤nods¤ ¤hand movement¤ #fig3
03	**ROB**	**tu sais chanter? beep** *"can you sing?"*
04	**LEA**	***non*** *"no"* *shakes head*
05	**ROB**	**¤(.)¤ moi non plus (.) je chante comme une casserole** *"me neither, I sing like a pot"* ¤nods¤
06	 lea	**(1.5)*(.) *** *nods head*
07	**ROB**	**qui est ton artiste préféré? beep** *"who is your favourite artist?"*

In extract (1), the interaction begins with the robot asking a question about the learner's singing ability. The robot's utterance is characterised by prosody that indicates it as a question (line 1). The learner's initial response, '*Euh*,' is a discourse particle expressing hesitation or uncertainty. This is followed by a direct denial, '*Non*,' indicating that the learner cannot sing. However, the robot failed to comprehend the learner's response as an answer, resulting in the repetition of the same question (line 3). The learner then repeats their response '*Non*' (No) and shakes their head to reinforce their previous answer. This time, the robot accepts '*Non*' as an answer by commenting 'Singing like a pot' on its own singing ability (line 5). This comment marks the end of the IRE sequence. Following the learner's silence, the robot initiates a new question (line 7), asking about the learner's favourite artist, '*Qui est ton artiste préféré?*' (Who is your favourite artist?), marking a shift in topic that guided the conversation beyond the initial singing query, starting a new IRE sequence.

Lacking robot literacy skills, the learners in the control group do not know how to solve interaction problems and resorted to using simple and short language. This suggests that they have not yet fully adapted to this new form of interaction. By contrast, the learners in the robot group often mirrored the syntactic pattern of the robot's utterances as demonstrated in extracts 2 and 3.

Extract 2 (robot group)

LEA	***oui* (2.2) je sais** *"yes. I can"* *nods*
ROB	**tu sais chanter? beep** *"can you sing?"*
LEA rob	**oui, je sais (1.1)¤(.)¤** *"yes, I can"* ¤nods¤
ROB lea	**oui? j'aime chanter aussi *(.)*** *"yes? I also enjoy singing"* *nods*
LEA	**d'accord** *"agreed"*

The sequence of Extract 2 begins with the robot asking the question '*Tu sais chanter?*' (Can you sing?), akin to the scenario depicted in Extract 1. The learner's initial response adopts a single-word format, '*Oui*' (Yes; line 2), accompanied by a non-verbal nodding gesture and brief pause. Following this, the learner reformulates their one-word response into an utterance with a subject-and-verb structure, introducing '*Je sais*' (I can; line 2). However, the robot encounters difficulty in assimilating the learner's two distinct utterances as a cohesive reply, prompting the repetition of the same question (line 3). In response to the reiterated question, the learner provides the same answer without a pause, stating '*Oui, je sais*' (Yes, I can; line 4), delivered without hesitation. The robot acknowledges this response and contributes a comment, '*Oui? J'aime chanter aussi*' (Yes? I also enjoy singing), signifying a successful interpretation of the learner's communication. The learner affirms the robot's statement with '*D'accord*' (agreed) and nods (line 7).

This demonstrates how learners understand that if they pause for too long, the robot may not comprehend their response as a whole. Learners utilise their robot literacy skills, which is evident in the way they manage pauses. This is a manifestation of their robot literacy.

Extract 3 contains two consecutive IRE sequences.

Extract 3 (robot group)

01	**ROB**	**qui est ton artiste préféré?** *"who is your favourite artist?"*
02	**LEA** rob	**je ne sais pas (1.0) ¤(.)¤** *"I don"t know"* ¤nods¤
03	**ROB**	**qui ¤est ton art¤iste préféré? beep** *"who is your favourite artist?"* ¤hand gesture¤
04	**LEA**	**(1.1)*(0.9) euh *(2.2)** *"uhm"* *leans to side*
05	**LEA** rob	**mon artiste préféré est (0.5)¤(.)¤(0.4) Le Dri** *"my favourite artist is Le Dri"* ¤nods¤
06	**ROB**	**moi je l'aime aussi** *"I like him too"*
07	 rob	**(2.1)¤(.) ¤(.)¤(.) ¤** ¤leans to side¤ ¤hand gesture¤
08	**ROB**	**tu aimes les Bleus?** *"do you like Les Bleus?"*
09	**LEA**	**oui (.) j'aime [les Bleus]** *"yes, I like Les Bleus"*
10	**ROB**	**[beep ¤(.)¤] vive les Bleus** *"long live Les Bleus"* ¤nods¤

The first sequence begins when the robot initiates the interaction by asking the learner, '*Qui est ton artiste préféré?*' (Who is your favourite artist? [line 1]). The learner responds with '*Je ne sais pas*' (I don't know). Owing to an error in the pre-scripted code, the robot fails to understand the learner's initial answer (line 2) and thus repeats the question (line 3). Following this, after a brief hesitation (line 4), the learner adopts the structure of the robot's question by incorporating the complement of the robot's phrase as the subject of his response, stating '*Mon artiste préféré est le Dri*' (My favourite artist is Le Dri; line 5). This demonstrates that unlike the learners in the control group, those in the robot group acquired robot literacy skills, which enabled them to structure their responses in line with the robot's utterance. The robot acknowledges this by nodding and commenting, 'I like him too,' marking the end of the first IRE sequence. The progression of the conversation continues with the robot posing a new question (line 8).

Similarly, in the next IRE sequence, the learner responds to the following question posed by the robot, '*Tu aimes les Bleus?*' (Do you like les Bleus? [line 8]) by adopting the vocabulary and structure of the robot's question and incorporating the verb and complement, '*Oui, j'aime les Bleus*' (Yes, I like les Bleus; line 9), indicating their positive sentiment towards *les Bleus*. The robot responds with an expression of enthusiasm, '*Vive les Bleus!*' (Long live les Bleus!), showing support for the team and closing the second IRE sequence accompanied by a nod. As the robot presented the pre-scripted questions in random order, the subjects of the questions did not always follow a logical progression. Here, the robot's new question (line 8) transitions preferences from music to sports. In this context, *Les Bleus* refers to the French national football team.

This linguistic strategy presented in the IRE sequences suggests a tendency among the learners in the robot group to echo the syntactic patterns presented by the robot, indicating a deeper level of interactional alignment between the learners and the robot.

4.3.2 Attempting alternative pronunciations

In Extract 4, which unfolds within a single IRE sequence, we continue to observe the same linguistic strategy of echoing syntactic patterns presented by the robot as in extracts 2 and 3. However, an additional strategy emerges. As the robot initiates the sequence by inquiring about the learner's liking, the unfolding response involves attempts to convey meaning by experimenting with alternative pronunciations. Despite their efforts, the learner's struggle to articulate a coherent response and the robot's persistent questioning led to a moment of frustration. The learner realises that the issue likely lies in their own pronunciation; thus, they attempt to modify their pronunciation, demonstrating their robot literacy skills. Upon realising that the issue is not with their pronunciation, they simplify their responses.

Extract 4 (robot group)

01	**ROB**	**tu aimes les Bleus? *(.)** ((IPA: tu ɛm lɛ blø))
		"do you like Les Bleus?"
	lea	*touches nose--->
02	**LEA**	**euh [(.)euh](1.0) j'¤aime*¤ (1.1) aime les Bleus** ((IPA : ʒ‿ɛm (1.1) ɛm lɛ blø))
		"I like, Les bleus"
	lea	-------------------------*
	rob	¤nods¤
03	**ROB**	**[beep]**
04	**ROB**	**¤tu aimes ¤ les Bleus? beep**
		"do you like Les Bleus?"
		¤hand gesture¤
05	**LEA**	***j'aime le **bleu (0.2)*¤(.)¤** ((IPA: ʒɛm lə blø))
		"I like blue"
	lea	*leans forward**leans back*
	rob	¤nods¤
06	**ROB**	**¤tu aimes ¤ les Bleus? beep** ((IPA: tu ɛm lɛ blø))
		"do you like Les Bleus?"
		¤hand gesture¤
07	**LEA**	***oui *(0.5)*(0.6)***
		"yes"
		hand gesture *looks away*
08	**ROB**	**tu aimes les Bleus? beep**
		"do you like Les Bleus?"
09	**LEA**	***OUI # *(0.3)¤(.)¤**
		"yes"
		leans forward with hand gesture
		¤nods¤
		#fig1
10	**ROB**	**vive les Bleus**
		"long live Les Bleus"

The IRE sequence begins with the robot posing a question, '*Tu aimes les Bleus?*' / tu ɛm le blø / (Do you like les Bleus?). The learner responds initially with a fragmented utterance, '*J'aime...*' / ʒ‿ɛm/ (I like...), followed by a pause as he thinks. The learner then completes his response by saying, '*Les bleus*' / le blø / (the Bleus), mirroring the robot's question (line 2). The robot, not comprehending the learner's fragmented response, repeats the same question: '*Tu aimes les Bleus?*' / tu ɛm le blø / (Do you like les Bleus? [line 4]). The learner modifies his response by attempting an alternative pronunciation to sustain the answer by changing the complement from '*Les Bleus*' / /lɛ blø / to '*Le bleu*' / lə blø /, ending up with a wrong meaning and saying, '*J'aime le bleu*' / ʒɛm lə blø / (I like the colour blue; line 5). However, the robot persists and repeats the question once again (line 6). The learner, showing signs of frustration, nods his head and reinforces his silent answer with a hand gesture (line 7). The robot, still not fully understanding the learner's response, repeats the question once more. In a more assertive manner, the learner responds with a loud '*OUI*' (YES), raising his voice and leaning towards the robot (line 9). Finally, the robot responds with enthusiasm, saying '*Vive les Bleus!*' (Long live the Bleus!), expressing support and excitement for *Les Bleus*, and the IRE sequence is closed.

In summary, in this study, the communication behaviour and strategies employed by learners in the robot group were a manifestation of their robot literacy. The learners demonstrated an understanding of the robot's language in terms of both its actual language (French) and sequence structuring, and adapted their L2 use to align with the robot's utterances. Interestingly, even though a pre-scripted robot may not adapt to the speaker's language, the learner adjusts to the robot's language. This adaptation, or mirroring of the robot's language, demonstrates the learner's ability to modify strategies, indicating a high level of robot literacy and familiarity. The learners also developed repair strategies to handle the robot's limitations, demonstrating their understanding of these constraints and their ability to modify their L2 communication strategies accordingly. Although the collected data set was small and had a lot of variance, these tendencies were also visible in the quantitative results. This study underscores the dynamic nature of interaction and the role of robot literacy in shaping effective engagement and learning outcomes.

5 Discussion

Drawing from the works of Randall (2019), Lee and Lee (2022), and Alemi and Haeri (2020), we investigated the nuances of CRI in L2 learning, focusing on the relationship between robot literacy, affective factors, and L2 communication strategies. Our study compared two groups of learners: those with semester-long experience with robots (the robot group) and those with only a brief introductory period (the control group). By employing both quantitative and qualitative analyses, we aimed to gain a detailed understanding of the factors influencing CRI in this experimental context.

Our findings suggest a mutual reinforcement between robot literacy and the repertoire of communication strategies, leading to the development of effective interaction skills with the robot. Through their familiarity with the robot, young learners in the robot group were able to manage emotional factors such as language anxiety, which influenced both the frequency and variety of communication strategies they employed.

Given the subjective nature of measuring anxiety and WTC in young learners, we primarily focused on their readiness to participate in interactions. Our findings resonate with the work of Pawlak et al. (2016), who highlighted the crucial link between familiarity with the interlocutor and WTC.

While previous research emphasizes the benefits of robot interactions (Randall, 2019), our results indicate that novelty may also present challenges. Control group learners unfamiliar with the robot exhibited hesitance and uncertainty in addressing communication issues, underscoring the importance of acquiring robot literacy over time. As learners become more adept, they develop effective communication strategies, creating further opportunities for interaction. Notably, even though the control group was one year older and more advanced in their French studies, the robot group performed better within the RALL context.

Both groups encountered similar challenges when the robot rejected initial responses. Control group learners often resorted to guided strategies, bypassing questions instead of exploring alternatives. For this group, the '*suivant*' ("next") command functioned similarly to the "enter" key on a computer, allowing them to progress without directly answering the question. In contrast, the robot group learners displayed increased resourcefulness by mirroring the robot's linguistic patterns and experimenting with different pronunciations. They employed self-repair strategies to clarify their answers, resulting in smoother interactions. This finding contrasts with previous adult studies (Rosenthal-von der Pütten et al., 2016).

Consistent exposure to the robot's prompts and feedback helped learners in the robot group effectively address communication challenges, demonstrating the potential of this approach in language learning contexts. This aligns with the interactional competence discussed by Doehler (2019), which emphasizes the development of effective communication skills.

Unlike previous research where learners underwent formal communication strategy training (Mesgarshahr & Abdollahzadeh, 2014), our robot group developed their skills over a semester-long period through diverse activities with the robot (Peura & Johansson, 2023). These immersive experiences facilitated the implicit development of new interaction skills. Moreover, when considering children as L2 learners, it is important to acknowledge that they are still in the developmental phase of acquiring interactional and pragmatic competencies in their native language.

We argue that consistent engagement is crucial for developing robot literacy, which encompasses understanding and critically evaluating robotic technologies, i.e. recognising the impact of discursive meanings, and social interactions, shaping perceptions and relationships with these technological, and becoming aware of the limits of an artificial agent. While generative AI is not yet established in classrooms, various AI-based technological applications are already embedded in the learning environments. Our findings also resonate with UNESCO's (2021) goals for adaptability to emerging technologies that foster lifelong learning. Both robot literacy and effective repertoire of related communication strategies promote equitable engagement that empowers learners to achieve independence in their communication. This empowerment is crucial for social sustainability, as highlighted by Kyckling et al. (2019), who emphasize prioritizing pedagogical approaches that integrate language awareness and rich learning experiences.

Furthermore, this investigation aligns with broader recognition of linguistic sustainability by providing consistent, interactive language practice opportunities essential for enhancing language learning in environments with limited exposure, such as French as an L2 in this case. Implementing RALL aligns with addressing significant language-related challenges within mainstream education, where all learning and teaching opportunities should be enhanced, e.g. through the use of digital tools. Veivo et al. (2023) highlight that students have a strong interest in language learning, driven by personal aspirations and the perceived usefulness of language skills. However, structural barriers often discourage students from pursuing their studies. Integrating robots into language education can foster a more inclusive learning environment, expanding students' understanding of language in diverse contexts. Robots can alleviate resource disparities by providing essential language practice and support also in informal settings, particularly for those lacking access to traditional educational resources.

Despite these encouraging results, our study has its limitations. The experimental setting lacked longitudinal data, and individual differences in L2 proficiency were not considered in the quantitative analyses. However, it is reasonable to assume that the robot and control groups shared similarities prior to implementing RALL, providing valuable insights into the dynamics of this educational approach. Future research could benefit from a longitudinal design and a larger participant pool to further validate our preliminary findings.

In conclusion, our study enriches existing research on the impact of social robots on oral competence in language learning (Lee & Lee, 2022; Lin et al., 2022). It provides insights into how children manage communication breakdowns in RALL contexts, building on the works of Honkalammi et al. (2022) and Jakonen et al. (2024). Furthermore, our study raises intriguing questions about the nature of communication skills acquired beyond mere language proficiency. This holistic approach is crucial for maximizing the potential benefits of RALL in language education and aligns well with ongoing discussions about linguistic sustainability.

6 Conclusion and future implications

In this study, we explored the complexities of CRI in L2 learning over an extended period. We highlighted the interplay between the readiness to communicate and anxiety, novelty and familiarity. As the novelty of robot interaction diminished and familiarity increased, learners' strategies improved, leading to smoother communication and a better understanding of language structures. The learners in the robot group demonstrated heightened interaction frequency and employed various communication strategies to manage conversation breakdowns, reflecting their acquired robot literacy.

In the rapidly changing world, effective CRI strategies are also informed by robot literacy. Hence, especially in the case of less-taught languages in the Finnish context, developing robot literacy might further improve learning outcomes in L2. However, addressing RALL's technical challenges, especially speech recognition, is crucial for effective learning experiences.

Our study provides insights into the potential benefits and challenges of incorporating robots into language learning environments. These findings have implications for the design of RALL systems and instructional interventions aimed at enhancing the oral competence and communication skills of language learners. This study shows how we can answer language-related challenges in mainstream education and promote equity in language education, fostering sustainable language development.

Building on these insights, we propose expanding the definition of robot literacy to include communication readiness, emphasizing learners' preparedness for interactions with robots. This shift highlights the holistic nature of their interactional competencies. Future research should investigate the potential transferability of these competencies across various communication settings involving AI-driven social robots.

Looking ahead, the continuous evolution of technology suggests that social robots could become integral to education. They have the potential to diversify classroom experiences, ensure equal opportunities, and enhance accessibility in language education. This integration could promote sustainable language learning practices, further highlighting the role of robot literacy in advancing social and linguistic sustainability at the intersection of technology, education, and societal progress.

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APPENDIX 1: Public Speaking Anxiety Scale (PSCAS) questionnaire

Sentences (Likert scale ranging from 1 to 5)
1. *En ole koskaan täysin varma itsestäni puhuessani ranskaa*. (I'm never completely sure of myself when speaking French.)
2. *Tunnen paniikkia, kun joudun puhumaan ranskaa ilman ennakkovalmisteluja*. (I feel panic when I have to speak French without preparation.)
3. *Ranskan tuntien suullisissa esitystilanteissa jännitän joskus niin kovasti, että unohdan osaamani asiat ja sanat*. (In oral presentations during French lessons, I sometimes get so nervous that I forget the things and words I know.)
4. *Tunnen oloni itsevarmaksi puhuessani ranskaa*. (I feel confident when speaking French.)
5. *Olen hermostunut ja hämmentynyt, kun puhun ranskaa*. (I get nervous and flustered when I speak French.)
6. *Pelkään, että luokkatoverini nauravat minulle, kun puhun ranskaa*. (I'm afraid my classmates will laugh at me when I speak French.)
7. *En pelkää puhua ranskaa*. (I'm not afraid to speak French.)
8. *Tunnen sydämeni hakkaavan, kun on minun vuoroni puhua*. (I feel my heart racing when it's my turn to speak.)
9. *Tunnen oloni rennoksi puhuessani ranskaa*. (I feel relaxed when speaking French.)
10. *Minua nolottaa olla vapaaehtoisesti ensimmäinen, joka esittää/puhuu ranskaa luokassa*. (I feel embarrassed to voluntarily be the first one to present/ speak French in class.)
11. *Ajattelen luottavaisin mielin tilanteita, joissa minulla on mahdollisuus puhua ranskaa*. (I think confidently about situations where I have the opportunity to speak French.)
12. *Kehoni tuntuu jännittyneeltä ja jäykältä puhuessani ranskaa*. (My body feels tense and rigid when I speak French.)
13. *Kehoni tuntuu jännittyneeltä ja jäykältä puhuessani ranskaa*. (My body feels tense and rigid when I speak French.)
14. *Tunnen oloni ahdistuneeksi, kun odotan vuoroani puhua ranskaa*. (I feel anxious when waiting for my turn to speak French.)

15. *En tykkää käyttää elekieltä (kehon kieltä ja ilmeitä) kun puhun ranskaa.* (I don't like using body language and expressions when speaking French.)
16. *Minulla on vaikeuksia hallita liikkeitäni puhuessani ranskaa.* (I struggle to control my movements when speaking French.)
17. *Vaikka olen hyvin valmistautunut, minua jännittää/hermostuttaa puhua ranskaa.* (Even though I'm well prepared, I still get nervous speaking French.)
18. *Minua jännittää/hermostuttaa puhua ranskaa robotin kanssa.* (I get nervous speaking French with a robot.)