The Effect of Realizing Emotional Synchrony with Teachers or Peers on Children's Linguistic Proficiency: The Case Study of Uji Elementary School

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Abstract—This paper reports on a joint research project in which a researcher in applied linguistics and elementary school teachers in Japan explored new ways to realize emotional synchrony in a classroom in childhood education. The primary purpose of this project was to develop a cross-curriculum of the first language (L1) and second language (L2) based on the concept of plurilingualism. This concept is common in Europe, and can-do statements are used in forming the standard of linguistic proficiency in any language; these are attributed to the action-oriented approach in the Common European Framework of Reference for Languages (CEFR). CEFR has a basic tenet of language education: improving communicative competence. Can-do statements are classified into five categories based on the tenet: reading, writing, listening, speaking/ interaction, and speaking/ speech. The first approach of this research was to specify the linguistic proficiency of the children, who are still developing their L1. Elementary school teachers brainstormed and specified the linguistic proficiency of the children as the competency needed to synchronize with others – teachers or peers – physically and mentally. The teachers formed original can-do statements in language proficiency on the basis of the idea that emotional synchrony leads to understanding others in communication. The research objectives are to determine the effect of language education based on the newly developed curriculum and can-do statements. The participants of the experiment were 72 third-graders in Uji Elementary School, Japan. For the experiment, 17 items were developed from the can-do statements formed by the teachers and divided into the same five categories as those of CEFR. A can-do checklist consisting of the items was created. The experiment consisted of three steps: first, the students evaluated themselves using the can-do checklist at the beginning of the school year. Second, one year of instruction was given to the students in Japanese and English classes (six periods a week). Third, the students evaluated themselves using the same can-do checklist at the end of the school year. The results of statistical analysis showed an enhancement of linguistic proficiency of the students. The average results of the post-check exceeded that of the pre-check in 12 out of the 17 items. Moreover, significant differences were shown in four items, three of which belonged to the same category: speaking/ interaction. It is concluded that children can get to understand others' minds through physical and emotional synchrony. In particular, emotional synchrony is what teachers should aim at in childhood education.

Keywords—Elementary school education, emotional synchrony, language proficiency, sympathy with others.

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I. Introduction

LANGUAGE education for children is expected to improve their basic linguistic proficiency. The first language (L1) for children in Japan is Japanese. In this monolingual country, Japanese is the only subject in elementary school language education. As children can easily interact with others in L1, literacy rather than oral communication is judged as linguistic proficiency. In 2011, however, the Japanese Ministry of Education, Culture, Sports, Science and Technology finally introduced English activities into elementary schools. Since then, many classrooms have been filled with meaningful English interaction through words or gestures. Moreover, it is observed that children are not only likely to move their bodies but also express their emotions in the same way as their teachers. English is their second language (L2), and it has become apparent that L2 education is quite distinct from L1. This radical change—the introduction of English activities—in primary education therefore has the potential to revolutionize language education.

II. Literature Review

When students interact with their teacher, they move their bodies in the same way as the teacher does, with the same rhythm [1]. This reaction is defined as "synchrony," and in a classroom it is necessary for students in activities to connect with each other [1]. There is evidence that synchrony is an innate and fundamentally necessary part of the human ability to engage in social interaction with other people, since people complete some shared communication tasks in the presence of one another [2]. Synchrony can also more generally facilitate the performance of cognitive or linguistic tasks [3].

In acquiring language, younger students are more influenced by the experience of emotion [4]. Reference [5] argued that the automatic and unconsciously embodied simulation of another's actions, intentions, and emotions is due to neuronal mechanisms, and the embodied simulation constitutes a fundamental and functional mechanism for empathy and understanding another person's mind. Internal representations of the body states associated with the emotions are evoked in the observer, "as if" he or she were doing a similar action or experiencing a similar emotion [5].

It is easy to imagine that children find it difficult to simulate teachers' or peers' emotions in L2 communication. However, some children cannot simulate emotions, even in L1 [6]. This leads to the argument that simulating another's emotions is a

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common underlying proficiency in all languages. Based on the dual-iceberg model, which was propounded by [7] and [8], a model of the lack of such proficiency in L2 is suggested in Fig. 1 [9].
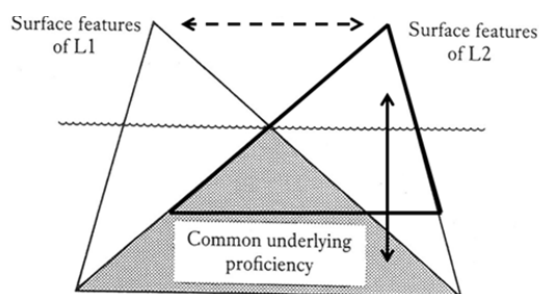

Fig. 1 The lack of common underlying proficiency in L2 [9]

In order to grow students' common underlying proficiency, it might be effective to integrate L1 and L2 education with the concept illustrated in Fig. 1. Previous researchers have asserted that physically synchronizing with others leads to sharing the same emotions with them. "Emotional synchrony" is a term to mean sharing the same emotions with others, or understanding others in communication. It is a common underlying proficiency.

The concept of plurilingualism has never been common in Japan. Therefore, it has fallen behind amid the global trend since the 1990s, wherein many non-English-speaking countries have assigned English as a subject in elementary school. This is an opportunity to prove that L2 learning does not hinder L1 acquisition, but rather helps students realize that the essence of communication is the same in any language. The research team for this study consisted of elementary school teachers and researchers at a university, who started a project to integrate Japanese (L1) and English (L2) education.

Plurilingualism is different from multilingualism. The Council of Europe defines multilingualism as a term to express the situation of societies, and plurilingualism as a term to express the competency and worth of each person [10]. To be more specific, multilingualism describes a situation, wherein several languages are used in a society. On the other hand, plurilingualism describes a situation wherein one person has integral competence in using more than two languages, and his/ her values are not limited to only using his/ her L1 for communication. Plurilingualism is a useful term when developing language education goals. Education for plurilingualism is described as a way to develop a learner's language repertoire, which covers his/her lifelong learning [11]. Language education is not limited to schools, but schools have a central function without an alternative to realize plurilingualism [12].

Unlike Japan, an isolated country, plurilingualism is a common concept in Europe. Can-do statements are used to show standards of linguistic proficiency in any language, which is attributable to the action-oriented approach in the Common European Framework of Reference for Languages (CEFR). There are five categories of can-do statements: reading, writing, listening, speaking/ interaction, and speaking/ speech. A basic tenet of language education in CEFR is improving communicative competence [13].

III. RESEARCH QUESTIONS

This study is based on the idea that a common underlying proficiency is to simulate anther's emotions. As children can associate bodily states with emotions, physical synchrony with others can be associated with emotional synchrony. Therefore, if both L1 and L2 language classes focus on realizing some kind of synchrony in a classroom, then children's linguistic proficiency might improve.

The research questions of this study are:
1) What kind of can-do statements list can check common underlying proficiency of L1 and L2?
2) How does linguistic proficiency of children improve through one-year of instruction?

The goal of this study is to answer these research questions.

IV. METHODOLOGY

A. Participants

Uji Elementary School, Kyoto, Japan, took part in this experiment. It is a general-size metropolitan school. The participants were 72 third-grade students, who were divided into three classes.

B. Procedure

The process of the research had five steps:
1) Specifying linguistic proficiency,
2) Developing the cross-curriculum of L1 and L2,
3) Forming can-do statements,
4) Creating a can-do checklist, and
5) Executing the experimental lessons for a school year.

The primary purpose of this project was to develop an L1 and L2 cross-curriculum based on the concept of plurilingualism. It was executed by a joint team of a researchers in applied linguistics and elementary school teachers. As for Step 1, Step 2, and Step 3, the details were reported in [14]. All the teachers in Uji Elementary School brainstormed and specified the linguistic proficiency of children as the competency needed to synchronize with others--teachers or peers--physically and mentally. The excerpted data of their utterances in brainstorming is as follows:

The linguistic proficiency of children is:
- To utilize gestures or eye contact to be understood,
- To change voice tones or strength in speaking,
- To notice another's movement or rhythm, and synchronize with them,
- To feel as if one is in another's position, and
- To notice one's friends' sadness, even when they smile.

Excerpts above referred to synchrony with teachers or peers not by using words, but with the mind. It is interesting to note that the teachers judged non-verbal physical or mental movement as linguistic proficiency.

Next, the joint project members integrated L1 and L2 curriculums into a cross-curriculum by focusing on tasks for arousing synchrony with teachers or peers. Based on this

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curriculum, original can-do statements in language proficiency were formulated. Not all factors in the teachers' definition of linguistic proficiency, however, overlapped with can-do statements. The teachers also determined a kind of metaphysical item that can hardly be judged as *can* or *cannot*.

In Step 4, a can-do checklist was created for the experiment. It was intended to let the children evaluate themselves in linguistic proficiency, and was written with simple expressions for them to easily understand. It consisted of 17 items that were developed from the can-do statements formed by the teachers, divided into the same five categories as those of CEFR: reading, writing, listening, speaking/ interaction, and speaking/ speech. The original list was written in Japanese, but Table I shows the translated English version.

TABLE I
ITEMS IN THE CAN-DO CHECK LIST

Categories	Items
Reading	1. I can read aloud paying attention to sound.
	2. I can read aloud conveying contents and scenes.
	3. I can read silently tasting images and beauty.
Listening	4. I can listen tasting sound and rhythm.
	5. I can listen not to miss what is significant.
	6. I can listen to peers' thoughts, comparing them to my own.
Speaking/ Speech	7. I can speak to make my idea understood.
	8. I can speak clearly, caring my posture and voice.
	9. I can make presentations showing pictures or some charts.
Speaking/ Interaction	10. I can change my manner of speaking according to the person I speak to.
	11. I can use gestures or eye contact in speaking.
	12. I can express my feeling of thanks or happiness.
	13. I can change my voice pitch, strength, or pauses.
	14. I can react to my peers' speech.
Writing	15. I can write paying attention to connections of words or sentences.
	16. I can express my ideas clearly in writing.
	17. I can write with interest in the shape or meaning of Japanese letters.

The experiment consisted of three steps:
1) The children evaluated themselves using the can-do checklist at the beginning of the school year.
2) One year of instruction was given to the children in Japanese and English classes (Japanese: five periods a week; English: once a week).
3) The children evaluated themselves using the same can-do checklist at the end of the school year.

C. Results

The children answered either yes or no to each item. The scale was converted into points (Yes: 1 point; No: 0 points). In Table II and Fig. 2, the average of the children is compared item by item.

Pre- and post-check scores of each item were compared and analysed statistically. A statistical significance between pre- and post-check was found with Item 6, Item 10, Item 12, Item 13, and the total score of 17 items (See Table III).

The average of the total score increased from 11.013 (the full score is 17) to 11.903 between pre- and post-check. No significant difference was found ($p > 0.05$), but the effect size was proved to be large ($d=16.60$).

TABLE II
AVERAGE SCORE OF PRE- AND POST-CHECK ON 17 ITEMS

Item	pre	post
1	0.77	0.72
2	0.73	0.84
3	0.73	0.76
4	0.76	0.77
5	0.80	0.81
6	0.74	0.88
7	0.71	0.74
8	0.69	0.62
9	0.69	0.67
10	0.79	0.93
11	0.67	0.70
12	0.83	0.92
13	0.72	0.81
14	0.66	0.68
15	0.62	0.69
16	0.62	0.73
17	0.68	0.64
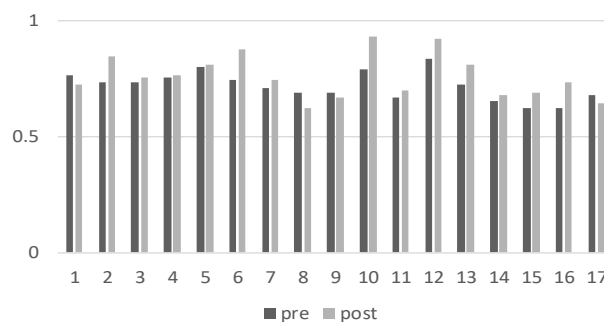
Fig. 2 Comparison of pre- and post-check of 17 items

TABLE III
THE RESULTS OF T-TEST

Item	M	SD	N	t	df	p
6	0.744	0.438	72	2.415	89	0.017
	0.877	0.329	72			
10	0.788	0.410	72	2.812	89	0.006
	0.933	0.250	72			
12	0.666	0.374	72	2.182	89	0.031
	0.700	0.269	72			
13	0.722	0.450	72	3.782	89	0.000
	0.922	0.269	72			
total	11.013	3.959	72	1.732	71	0.088
	11.903	3.246	72			

V. FINDINGS

The average results of the post-check exceeded that of the pre-check in 12 out of the 17 items in the can-do checklist. Significant differences were proved in the statistical analysis in four of the 17 items. Item 6, *I can listen to peers' thoughts, comparing them to my own,* belonged to the category "Listening" in the can-do checklist. Moreover, three items belonged to the category "Speaking/ Interaction": Item 10, *I can change my manner of speaking according to the person I speak to*; Item 12, *I can express my feelings of thanks or*

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happiness; and Item 13, *I can change my voice pitch, strength, or pauses.* Significantly, the children paid more attention to interaction with others than before starting the experiment. Most importantly, they now tried to understand the person whom they speak to, to make themselves understood by him/her, and to share emotions.

VI. CONCLUSION

This study had two research questions. The first one was: what kind of can-do statements can check common underlying proficiencies of L1 and L2? Specifying linguistic proficiency in teachers' brainstorming led to the idea that those linguistic proficiencies incorporate the ability to sympathize with others. It was also proved that the same five categories of can-do statements as those of CEFR can be adopted into the can-do check list for common underlying L1 and L2 proficiencies.

The second research question was: how does the linguistic proficiency of children improve through one-year instruction? The results of the experiment prove that the third graders of an elementary school were conscious of their improvement in linguistic proficiency. Probably unconsciously, they nonetheless utilized facial expressions or gestures, or arranged their ways of speaking, which aroused the reaction of the person they speak to, i.e., the listener's physical synchrony with them, speakers. On the contrary, the children embodied simulation of teachers' or peers' actions and intentions, which led to the feeling that they listened to peers' thoughts, comparing them to their own.

The main conclusion is that children can understand others' minds through physical movement or senses in any language when they are instructed appropriately, and that emotional synchrony should be the central concept in language instruction in childhood education.

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