# Cross-modal Referential Acts and Information Status in Mandarin-Speaking Five-Year-Old Children's Conversation

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## 1. Introduction

Recent studies have shown that referring is a multimodal phenomenon (Ateş & Küntay, 2018; Azar et al., 2019; Demir et al., 2012; Goldin-Meadow, 2007; Levy & McNeill, 1992; So et al., 2009, 2010). A referent can be referred to verbally through various expressions, such as nominal forms, pronominal forms, and null forms. Each form carries various degrees of informativeness; nominal forms are more informative and explicit, while pronominal forms and null forms are less informative and implicit. Non-verbal referential acts such as gestures and communicative functional acts can also be used to indicate a speaker's interest in an object. For instance, pointing or showing, the so-called deictic gestures, can be used to refer to the object being pointed at or held in a hand. Communicative functional acts such as reaching and requesting also indicate the speaker's intention toward certain objects.

Children's early referential communication is primarily through non-verbal means (Bates, 1976). Infants and prelinguistic children produce showing and pointing gestures to indicate an intended referent and direct their listener's attention toward it. These non-verbal referential acts are considered as object-referring terms, similar to nouns and pronouns, in prelinguistic children's communication (Goldin-Meadow, 2007). Children later combine these non-verbal acts with verbal ones to express sentence-like meaning. These verbal-non-verbal combinations mark the beginning of the integration of the two modalities in young children's communication to co-express meaning, and the two modalities develop together afterward (Cartmill et al., 2012; Goldin-Meadow, 2007, 2009). As children grow into more proficient language users, their non-verbal devices no longer stand in for words or syntactic structures they have not yet acquired and may serve other functions at the discourse level, such as indicating their cognitive development (Goldin-Meadow, 2007) and reflecting their understanding of the ongoing conversational context (Demir et al., 2012; So et al., 2010). Earlier researchers have pointed out the importance of non-verbal acts in children's referential interactions and suggested that to further understand the development of children's communicative intentions and abilities, more studies are needed to include children's non-verbal behaviors (Allen et al., 2015;

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Cartmill et al., 2012; Ng et al., 2015), because these behaviors provide valuable information that may reveal hidden aspects of their current progress as well as their future development.

To achieve successful referential communication, children need to understand that perspectives vary and have the ability to identify and provide specific information accordingly to their listeners (Allen, 2000; Ariel, 1994; Graf & Davies, 2014). Both cognitive and linguistic abilities are needed in making clear references. A referent that is difficult to retrieve from one's memory requires specific and more information to be activated; on the other hand, a referent that has already been activated requires less information for identification (Ariel, 1994). Referential ability is therefore considered as a social-cognitive skill that is interactive and cooperative (Clark & Bangerter, 2004); it is also an ability that children need to acquire throughout their development.

Previous studies that considered referential communication from a multimodal perspective have reported that the information status (i.e., new and old) of referents influenced adult speakers' verbal and non-verbal referential expressions in similar ways (e.g., Azar et al., 2019; Holler & Stevens, 2007; So et al., 2009). The findings showed that speakers produced non-verbal referential acts to accompany verbal expressions and made their referential choices according to the information status of the referents. They tended to use informative forms, such as nominal forms, and produced non-verbal acts, such as gestures, more often for referents that were new to the discourse as opposed to referents that were previously mentioned. Moreover, some studies found that speakers' non-verbal referential acts were sensitive to the informativeness of verbal expressions. Speakers produced more non-verbal acts for referents that were expressed with informative forms, such as nominal phrases, than with reduced forms, such as pronominal forms (Azar et al., 2019; Debreslioska & Gullberg, 2019; So et al., 2009). These findings suggest that adult speakers' verbal and non-verbal referential acts are closely related and work as an integrated system at the discourse level (Levy & McNeill, 1992). Such usages have been found cross-linguistically in speakers of English (e.g., So et al., 2009), German (e.g., Debreslioska & Gullberg, 2019), Turkish (e.g., Azar et al., 2019), and Mandarin (e.g., So et al., 2009).

Earlier research that examined children's referential communication in relation to information status focused mainly on their verbal referential expressions (e.g., Allen, 2000; Clancy, 1997; Huang, 2011; Hughes & Allen, 2013), however, only a few studies discussed children's referential ability and their sensitivity to information status from a multimodal perspective (Ateş & Küntay, 2018; Demir et al., 2012; Guerriero et al., 2006; So et al., 2010). The findings of children's verbal acts showed that children from a young age began to produce more informative forms to indicate referents that were new and difficult to activate in or retrieve from memory, and they used reduced forms for previously mentioned referents that were easily retrievable (Allen et al., 2008; Clancy, 1997; Huang, 2011; Hughes & Allen, 2013). As for non-verbal referential acts, children tended to produce non-verbal acts more often to indicate new referents than those that were already known to their listeners (Ateş & Küntay, 2018; Guerriero et al.,

2006; So et al., 2010). Furthermore, the children were more likely to produce non-verbal devices for new referents that were expressed by reduced forms than by informative forms. These differences were found in children younger than age two (Ateş & Küntay, 2018) and later at age four (So et al., 2010). So and colleagues (2010) argued that the children used non-verbal devices to disambiguate referents that they underspecified in speech to compensate for their limited ability in lexical specification through speech. As previous studies have suggested, adult speakers used non-verbal devices for referents that were also specified in speech (Azar et al., 2019; So et al., 2009). Researchers have proposed that the use of non-verbal acts to disambiguate speech may be a characteristic of early childhood that fades away as children become more proficient speakers (So et al., 2010). However, more studies involving older children are needed to attest this hypothesis.

In addition, previous studies that included children of different languages found various usages in the children's referential acts (Demir et al., 2012; Guerriero et al., 2006; So et al., 2010). Demir et al. (2012) showed that Turkish-speaking children tended to use more pronominal forms and accompanied these forms with non-verbal devices for referents in the physical context, while English-speaking children preferred to use nominal forms. The Mandarin-speaking children in So et al.'s (2010) study also produced non-verbal acts for new referents more often than the English-speaking children of the same age did. These findings indicate that while the sensitivity to information status in making referential choices may be a general cognitive ability, the multimodal referencing skill seems to follow language-specific rules that children need to acquire throughout their development.

While increasing studies have considered referential communication as a multimodal phenomenon that involves both verbal and non-verbal acts, and the importance of the non-verbal modality in children's development has been highlighted by earlier scholars (Allen et al., 2015; Goldin-Meadow, 2007; Ng et al., 2015), relatively less research has examined children's referential ability in the two modalities and discussed how children integrate multimodal expressions of reference. Furthermore, for adult speakers, the information status of referents has been found to influence both verbal and non-verbal referential choices, less is known about such influence on children's non-verbal acts. As previous studies have suggested that the relationship non-verbal devices hold on to speech may reveal more details about children's current cognitive and language development after they start to use verbal and non-verbal devices as an integrated system (Goldin-Meadow, 2007, 2009), examining both modalities in children's production would provide a fuller understanding of their communicative intentions and referential abilities.

The present study therefore investigated Mandarin-speaking five-year-old children's referential ability across the two modalities to understand whether and how children use the two modalities to co-refer. The research questions are as follows: (1) Do children at age five demonstrate a sensitivity to information status in their referential choices, in both the modalities and the referential expressions they use?; and (2) Are children at age five more likely to produce non-verbal

devices to indicate referents that are also specified in speech, or do they use these devices to disambiguate referents that they underspecified through speech? It was hypothesized that the children would differentiate referents of different information status in both the modalities and the referential expressions they produced; in addition, as the five-year-old children have developed certain language skills, they would be more likely to use their non-verbal devices for referents that they had already specified in speech (i.e., nominal forms) than those they have not.

## 2. Methods

### 2.1. Participants and data

The data were selected from a corpus established at the Language Acquisition Lab at National Chengchi University, Taiwan, directed by Dr. Chiung-chih Huang. The participants included four Mandarin-speaking five-year-old children (two boys and two girls, $M_{age}$=5;3, age range=5;1-5;5). All of the children lived in Northern Taiwan and used Taiwan Mandarin as their first language. Their interaction with their mother at home was video-recorded. The data consisted of four hours of natural conversations (one hour per dyad). All of the mother-child dyads were involved in similar activities, such as playing with toys, reading books, and making art. The collected data were transcribed following the CHAT convention and analyzed by the CLAN program (MacWhinney, 2000) and the ELAN annotation tool (Max Planck Institute; Wittenburg et al., 2006; https://tla.mpi.nl/tools/tla-tools/elan/).

### 2.2. Analytical framework

The present study adopted Ateş & Küntay's (2018) and So et al.'s (2010) frameworks. Each of the third-person referents in the data was identified and coded for the following two levels: (1) information status and (2) referential acts. For the level of information status, a referent was coded as "new" if it had not been mentioned within the preceding five utterances; otherwise, it was coded as "old" (Allen, 2000; Huang, 2011; Hughes & Allen, 2013). Referential acts included the children's verbal, and non-verbal interactions about a third-person referent (Ateş & Küntay, 2018). Verbal and non-verbal acts can be used alone or in combination to co-refer to a referent (hereafter, cross-modal acts), for instance, saying *yèzi* 'leaf' and pointing at a leaf in a painting.

Referential expressions in the two modalities were further categorized. Verbal referential acts included the categories of null forms, pronominal forms, and nominal forms (Clancy, 1997; Huang, 2011). Each form represents different amount of informativeness with null forms being the least informative, nominal forms being the most informative, and pronominal forms falling in between. The three types of referential expressions are illustrated as follows:

a. Null forms: Lack of any overt forms.
b. Pronominal forms: pronouns (e.g., *tā* 'he/she/it', *tāmén* 'they'), demonstratives (e.g., *zhè*ge 'this', *nà*ge 'that'), and quantifiers (e.g., *yí*ge 'one CL').
c. Nominal forms: bare nouns (e.g., *shuìyī* 'pajamas', *bǐnggān* 'cookie'), proper names (e.g., *mǐní* 'Minnie Mouse', *bùlǔtuō* 'Pluto'), and noun phrases (e.g., *yíge yǐnxíng mǐqí* 'an invisible Mickey Mouse').

Non-verbal referential acts included gestures and communicative functional acts (Ateş & Küntay, 2018; Ateş-Şen, 2010; So et al., 2010):

a. Gestures: Hand movements that do not involve direct manipulation of an object or are not part of a ritualized game, including deictic gestures that single out a referent by pointing at it or raising it to show and iconic gestures that resemble the referents they represent (Goldin-Meadow & Mylander, 1984; see also Özçalışkan & Goldin-Meadow, 2005).
b. Communicative functional acts: Hand movements that involve the goal of communicating with a listener about a target referent, including speakers' requesting, reaching, giving, demonstrating, and placing behaviors (Ateş & Küntay, 2018).

## 3. Results

A total of 1923 referential acts were identified in the children's conversations with their mothers. Table 1 presents the distribution of the types of referential acts in their production. As expected, the children produced predominately verbal and cross-modal acts when they interacted with their mothers. They used verbal acts (74.73%) the most frequently, followed by cross-modal acts (23.82%). Non-verbal acts were the least used (1.46%). The children at this age had acquired some language ability and used speech as the preferred channel to communicate with their mothers. In addition, they also relied on cross-modal acts to indicate intended referents.

**Table 1. Distribution of referential acts in the children's production**

| Referential act | N | % |
|---|---|---|
| Non-verbal | 28 | 1.46 |
| Cross-modal | 458 | 23.82 |
| Verbal | 1437 | 74.73 |
| Total | 1923 | 100.00 |

Table 2 presents the distribution of the children's referential acts across information status. As shown in Table 2, when the children indicated new

referents, they used mainly verbal acts (66.63%) and cross-modal acts (32.00%). Non-verbal acts (1.36%) were seldom used for new referents. On the other hand, when they referred to old referents, they used predominately verbal acts (84.02%), followed by cross-modal acts (14.41%) and non-verbal acts (1.56%). Pearson's chi-squared test showed that the children's types of referential acts differed significantly for new and old referents ($\chi^2(2) = 81.65$, $p < .001$). A residual analysis with standardized residuals showed that the children used significantly more cross-modal acts for new referents, and more verbal acts for old referents. The findings indicated that the children produced more non-verbal acts to accompany their verbal acts for new referents as suggested in previous studies (Ateş & Küntay, 2018; So et al., 2010).

**Table 2. Distribution of referential acts across information status in the children's production**

| | New | | Old | |
|---|---|---|---|---|
| Referential act | N | % | N | % |
| Non-verbal | 14 | 1.36 | 14 | 1.56 |
| Cross-modal | 329 | 32.00 | 129 | 14.41 |
| Verbal | 685 | 66.63 | 752 | 84.02 |
| Total | 1028 | 100.00 | 895 | 100.00 |

Further analysis was conducted to examine whether the children's referential expressions also differed for new and old referents. Table 3 demonstrates the distribution of the children's referential expressions across information status. For non-verbal acts, the children used significantly more gestures to indicate new referents (92.86%), while they used more communicative functional acts such as reaching or giving to indicate old referents (57.14%) (Fisher's exact test, $p = .012$). For cross-modal acts, pronominal forms with gestures were the most frequent combination the children produced for new referents (47.11%), followed by nominal forms with gestures (25.23%) and pronominal forms with communicative functional acts (12.46%). On the other hand, pronominal forms with gestures (35.66%) and nominal forms with gestures (30.23%) were both used frequently for old referents. Pearson's chi-squared test showed that the children's types of cross-modal acts differed for new and old referents ($\chi^2(5) = 38.07$, $p < .001$). A residual analysis with standardized residuals showed that the children used significantly more pronominal forms with gestures or communicative functional acts when they indicated new referents, while they produced null forms with both types of non-verbal devices significantly more often for old referents. Their use of nominal forms with the two types of non-verbal devices were not significantly different across information status. As for verbal acts, the children produced nominal forms to indicate over half of the new referents (67.15%), and

they used pronominal forms and null forms more often for old referents (27.79% and 31.38%, respectively). Pearson's chi-squared test showed that the children's verbal referential expressions differed for new and old referents ($\chi^2(2) = 138.83$, $p < .001$). A residual analysis with standardized residuals indicated that nominal forms were used significantly more often for new referents and null forms were used significantly more frequent for old referents. Overall, the findings suggested that the children relied on nominal forms and pronominal forms with non-verbal devices, usually gestures, to provide sufficient information to their listener to clearly identify new referents. On the other hand, they used reduced forms such as null forms for referents that had been previously mentioned.

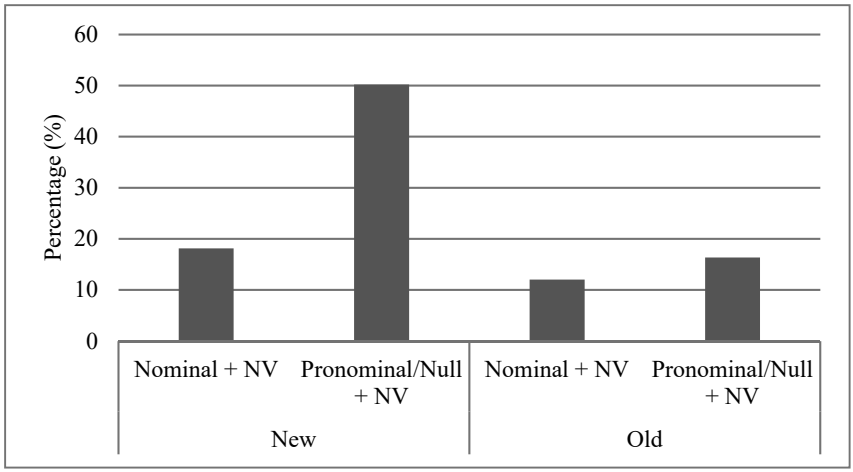
**Table 3. Distribution of referential expressions across information status in the children's production**

| | | New | | Old | |
|---|---|---|---|---|---|
| Referential act | Referential expression | N | % | N | % |
| Non-verbal act | Gesture | 13 | 92.86 | 6 | 42.86 |
| | CFA | 1 | 7.14 | 8 | 57.14 |
| | Total | 14 | 100.00 | 14 | 100.00 |
| Cross-modal act | Nominal + Gesture | 83 | 25.23 | 39 | 30.23 |
| | Nominal + CFA | 19 | 5.78 | 3 | 2.33 |
| | Pronominal + Gesture | 155 | 47.11 | 46 | 35.66 |
| | Pronominal + CFA | 41 | 12.46 | 4 | 3.10 |
| | Null + Gesture | 22 | 6.69 | 23 | 17.83 |
| | Null + CFA | 9 | 2.74 | 14 | 10.85 |
| | Total | 329 | 100.00 | 129 | 100.00 |
| Verbal act | Nominal form | 460 | 67.15 | 307 | 40.82 |
| | Pronominal form | 166 | 24.23 | 209 | 27.79 |
| | Null form | 59 | 8.61 | 236 | 31.38 |
| | Total | 685 | 100.00 | 752 | 100.00 |

*CFA: Communicative functional act

The results so far suggested that the children were sensitive to the information status of a referent and made their referential choices accordingly, both in the modalities and the specific referential expressions they used. We further examined whether the children's production of non-verbal devices differed as a function of their verbal expressions as found in adult usages (Azar et al., 2019; So et al., 2009). Figure 1 shows the proportion of nominal forms that were accompanied by non-

verbal devices as opposed to that of pronominal forms or null forms with non-verbal devices. As seen in Figure 1, the children were more likely to combine pronominal forms or null forms with non-verbal devices than nominal forms. In addition, the differences were more salient when they referred to new referents. The proportion of pronominal or null forms with non-verbal devices were two-and-a-half times more than that of nominal forms with non-verbal devices for new referents. The findings indicated that the use of pronominal or null forms with non-verbal devices may be a special combination the children relied on when they intended to provide sufficient information to their listeners to identify referents that were new to the discourse.




*NV: Non-verbal act

**Figure 1. The proportion of nominal forms with non-verbal devices and pronominal forms or null forms with non-verbal devices across information status in the children's production**

Example (1) and Example (2) illustrate the children's use of pronominal forms with non-verbal devices. In Example (1), KUO and MOT were dressing up a Minnie Mouse figure. KUO held up two pairs of shoes to differentiate high heels from another pair of shoes. She uttered *zhèyíge* 'this one' and showed each pair of the shoes to her mother to attract her mother's attention to the two pairs of shoes. This usage could draw attention to the objects in KUO's hand and may further highlight the comparison between the two objects. In Example (2), QIN realized the difference between two pieces of a mold and compared the two pieces. In his utterances, he used the demonstratives *zhèbiān* 'here' and *zhèlǐ* 'here' with pointing gestures to refer to each of the two pieces. Although he used the same demonstrative to indicate the two pieces of the mold, his pointing gestures clearly identified each of the intended pieces. These cross-modal acts were informative enough for his mother as evidenced by her acknowledgement *duì* 'right'.

(1) KUO and MOT are dressing up a Minnie Mouse figure.

| | | | | | |
|---|---|---|---|---|---|
| *KUO: | *Zhèyíge* | *cái* | *shì* | *Mǐní* | *de* |
| | this one | CAI | COP | Minnie Mouse | DE |
| | *gāogēnxié* | [% showing a pair of shoes in her hand]. ← | | | |
| | high heels | | | | |
| | 'These are the high heels of Minnie.' | | | | |
| *KUO: | *Zhèyíge* | *bú* | *shì* [% raising up another pair of shoes]. ← | | |
| | this one | NEG | COP | | |
| | 'These are not.' | | | | |
| *KUO: | *Nǐ* | *kàn.* | | | |
| | 2SG | look | | | |
| | 'Look.' | | | | |
| *KUO: | *<zhège >* | [>] +/. | | | |
| | this | | | | |
| | 'These.' | | | | |
| *MOT: | *<Dōu >* [//] [<] | *quánbù* | *dōu* | *shì* | *gāogēnxié.* |
| | | all | all | COP | high heels |
| | 'Both of them are high heels.' | | | | |
| *MOT: | *Tā* | *dōu* | *ài* | *chuān* | *gāogēnxié.* |
| | 3SG | always | love | wear | high heels |
| | 'She loves to wear high heels.' | | | | |

(2) QIN is playing with clay and realizes differences between two pieces of a mold.

| | | | | |
|---|---|---|---|---|
| *QIN: | *È* | *nǐ* | *kàn.* | |
| | PRT | 2SG | look | |
| | 'Hey, look.' | | | |
| *QIN: | *Zhèbiān* | *yǒu* | *hénjī* | [% points at one piece of the mold]. ← |
| | here | have | mark | |
| | 'There is a mark here.' | | | |
| *QIN: | *Zhèlǐ* | *méiyǒu* | [% points at another piece of the mold]. ← | |
| | here | NEG | | |
| | 'There is not.' | | | |
| *MOT: | *Duì* | *ya.* | | |
| | right | PRT | | |
| | 'Right.' | | | |

## 4. Discussion

The results showed that both the verbal and non-verbal referential acts of the Mandarin-speaking five-year-old children were influenced by the information status of referents. While verbal acts were the most frequent in the children's referential communication, cross-modal acts also played an important part, especially when they referred to new referents. The children differentiated new and old referents in both the modalities and the referential expressions they used. When they indicated new referents, the children produced more cross-modal acts and used more informative forms, such as nominal forms as well as pronominal

forms with non-verbal devices. On the other hand, when they referred to referents that had been previously mentioned, they tended to use verbal acts and less informative forms such as pronominal and null forms. These findings indicated that the children were sensitive to the information status of referents and made their verbal and non-verbal referential choices accordingly. The results were in line with previous findings that children relied on cross-modal acts as a way to indicate referents that were new to the discourse and therefore needed more information to be clearly identified (Ateş & Küntay, 2018; Demir et al., 2012; Guerriero et al., 2006; So et al., 2010). Such uses of cross-modal acts were seen even when the children had acquired some linguistic ability at age five, indicating the importance of these behaviors in children's development. Furthermore, earlier studies on adult speakers' and caregivers' production also showed increasing usages of gestures when they talked about new referents in both conversations and narratives (Azar et al., 2019; Guerriero et al., 2006; Holler & Stevens, 2007; So & Lim, 2012). In addition, caregivers were found to frequently use reduced forms with non-verbal devices when they interacted with young children, especially in object-referring questions (So & Lim, 2012). These findings suggested that the use of cross-modal combinations may be a characteristic of face-to-face interaction rather than that of children's limited language ability. However, more studies are needed to further understand this issue.

The present findings also demonstrated that the information the children expressed in the two modalities may not be as fully integrated as it was seen in adult usages. The children relied on non-verbal devices to provide additional information, such as using a pointing gesture to single out the intended referent in the physical context, to disambiguate target referents (Goldin-Meadow, 2007; So et al., 2010). On the other hand, the adults' non-verbal devices may play a rather facilitative role since their speech already provided sufficient information for reference-resolution (Azar et al., 2019; So et al., 2009).

One possibility of such usages is that the children combined underspecified forms, such as pronominal forms and null forms, with non-verbal devices to indicate referents that were hard to differentiate solely in verbal forms in order to communicate effectively, as seen in Examples (1) and (2). Since the children and their mothers were engaged in a joint activity, such as dressing up a doll and molding clay, and focused their attention on those objects, it may be more effective to identify target referents through both speech and perceptual channels than through speech alone. Another possibility is that the children used these cross-modal combinations due to the high similarities between multiple competitors in the surrounding environment. In the daily interactions between the children and their mothers, the activities usually involved several objects that shared similar attributes, for instances, a set of blocks, a set of clay, or clothes for a toy figure. These objects with high similarities required more specific information to be clearly identified in speech. Using non-verbal devices such as pointing to directly single out a target object may reduce the cognitive demand and be more efficient in face-to-face conversations. In other words, the cross-modal acts may be an alternative way for the children to disambiguate a target referent from multiple competitors in the environment.

Researchers have speculated that speakers of null argument languages may be more attentive to the physical context than speakers of languages that do not allow argument omission since they cannot depend on speech to provide sufficient information to clarify a referent (Demir et al., 2012), and they may regularly use reduced forms with a gesture to identify a referent when it is present in the physical context (Allen et al., 2015; Demir et al., 2012; So et al., 2010). The present findings may provide more evidence of this claim and further demonstrated the Mandarin-speaking children's acquisition of cross-modal acts as a language-specific strategy.

## 5. Conclusion

The present study examined Mandarin-speaking five-year-old children's verbal and non-verbal referential acts in relation to the information status of referents. The findings showed that verbal acts were the most frequent in the children's referential communication; however, cross-modal acts also played an important part, especially when they referred to new referents. The children distinguished new and old referents in the modalities as well as in the referential expressions they used. The current study demonstrated the Mandarin-speaking children's referential ability across modalities to co-express referents and further suggested that their referential choices in both modalities may reflect their communicative and pragmatic competence. Future studies are still needed to examine the relation between non-verbal acts and other discourse factors, especially those related to physical context, such as physical presence and disambiguation in physical context, in order to better understand the role of non-verbal devices in children's development.

## Appendix A: Transcription conventions

| | |
|---|---|
| +/. | Other-interruption |
| [//] | Rephrasing |
| [>] | Overlap follows |
| [<] | Overlap precedes |
| [% text] | Comments on the main line |

## Gloss abbreviations

| | |
|---|---|
| 2SG | Second-person singular |
| 3SG | Third-person singular |
| CAI | *Cái* adverb |
| COP | Copular verb |
| NEG | Negation |
| PRT | Particle |

## References


Allen, Shanley E. M. (2000). A discourse-pragmatic explanation for argument representation in child Inuktitut. *Linguistics, 38*(3), 483-521.

Allen, Shanley E. M., Hughes, Mary E., & Skarabela, Barbora. (2015). The role of cognitive accessibility in children's referential choice. In Ludovica Serratrice & Shanley E. M. Allen (Eds.), *The acquisition of reference* (pp. 123-153). John Benjamins.

Allen, Shanley E.M., Skarabela, Barbora, & Hughes, Mary. (2008). Using corpora to examine discourse effects in syntax. In Heike Behrens (Ed.), *Corpora in language acquisition research: History, methods, perspectives* (pp. 99-137). John Benjamins.

Ariel, Mira. (1994). Interpreting anaphoric expressions: A cognitive versus a pragmatic approach. *Journal of Linguistics, 30*(1), 3-42.

Ateş, Beyza Ş., & Küntay, Aylin C. (2018). Referential interactions of Turkish-learning children with their caregivers about non-absent objects: Integration of non-verbal devices and prior discourse. *Journal of Child Language, 45*(1), 148-173.

Azar, Zeynep, Backus, Ad, & Özyürek, Aslı. (2019). General- and language-specific factors influence reference tracking in speech and gesture in discourse. *Discourse Processes, 56*(7), 553-574.

Bates, Elizabeth. (1976). *Language and context: The acquisition of pragmatics*. American Academic Press.

Cartmill, Erica A., Demir, Özlem Ece, & Goldin-Meadow, Susan. (2012). Studying gesture. In Erika Hoff (Ed.), *Research methods in child language* (pp. 208-225). Wiley-Blackwell.

Clancy, Patricia M. (1997). Discourse motivations for referential choice in Korean acquisition. In Ho-min Sohn & John Haig (Eds.), *Japanese/Korean linguistics* (Vol. 6, pp. 639-657). CSLI.

Clark, Herbert H., & Bangerter, Adrian. (2004). Changing ideas about reference. In Ira A. Noveck & Dan Sperber (Eds.), *Experimental pragmatics* (pp. 25-49). Palgrave Macmillan.

Debreslioska, Sandra, & Gullberg, Marianne. (2019). Discourse reference is bimodal: How information status in speech interacts with presence and viewpoint of gestures. *Discourse Processes, 56*(1), 41-60.

Demir, Özlem Ece, So, Wing-Chee, Özyürek, Asli, & Goldin-Meadow, Susan. (2012). Turkish- and English-speaking children display sensitivity to perceptual context in the referring expressions they produce in speech and gesture. *Language and Cognitive Processes, 27*(6), 844-867.

ELAN (Version 6.1) [Computer software]. (2021). Nijmegen: Max Planck Institute for Psycholinguistics. Retrieved from https://archive.mpi.nl/tla/elan

Goldin-Meadow, Susan. (2007). Pointing sets the stage for learning language—and creating language. *Child Development, 78*(3), 741-745.

Goldin-Meadow, Susan. (2009). From gesture to word. In Edith L. Bavin (Ed.), *The Cambridge handbook of child language* (pp. 145-160). Cambridge University Press.

Goldin-Meadow, Susan, & Mylander, Carolyn. (1984). Gestural communication in deaf children: The effects and noneffects of parental input on early language development. *Monographs of the Society for Research in Child Development, 49*(3/4), 1-151.

Graf, Eileen, & Davies, Catherine. (2014). The production and comprehension of referring expressions. In Danielle Matthews (Ed.), *Pragmatic development in first language acquisition* (pp. 161-181). John Benjamins.

Guerriero, Sonia, Oshima-Takane, Yuriko, & Kuriyama, Yoko. (2006). The development of referential choice in English and Japanese: A discourse-pragmatic perspective. *Journal of Child Language, 33*(4), 823-857.

Holler, Judith, & Stevens, Rachel. (2007). The effect of common ground on how speakers use gesture and speech to represent size information. *Journal of Language and Social Psychology, 26*(1), 4-27.

Huang, Chiung-chih. (2011). Referential choice in Mandarin child language: A discourse-pragmatic perspective. *Journal of Pragmatics, 43*(7), 2057-2080.

Hughes, Mary E., & Allen, Shanley E. M. (2013). The effect of individual discourse-pragmatic features on referential choice in child English. *Journal of Pragmatics, 56*, 15-30.

Levy, Elena T., & McNeill, David. (1992). Speech, gesture, and discourse. *Discourse Processes, 15*(3), 277.

MacWhinney, Brian. (2000). *The CHILDES project: Tools for analyzing talk* (3rd ed.). Erlbaum.

Ng, Melvin Mai-Rong, Demir, Özlem Ece, & So, Wing Chee. (2015). The role of gesture in referential communication: A developmental perspective. In Ludovica Serratrice & Shanley E.M. Allen (Eds.), *The acquisition of reference* (pp. 105-122). John Benjamins Publishing Company.

Özçalışkan, Şeyda, & Goldin-Meadow, Susan. (2005). Gesture is at the cutting edge of early language development. *Cognition, 96*(3), B101-B113.

So, Wing Chee, Demir, Özlem Ece, & Goldin-Meadow, Susan. (2010). When speech is ambiguous, gesture steps in: Sensitivity to discourse-pragmatic principles in early childhood. *Applied Psycholinguistics, 31*(1), 209-224.

So, Wing Chee, Kita, Sotaro, & Goldin-Meadow, Susan. (2009). Using the hands to identify who does what to whom: Gesture and speech go hand-in-hand. *Cognitive Science, 33*(1), 115-125.

So, Wing Chee, & Lim, Jia Yi. (2012). Point to a referent, and say, "what is this?" Gesture as a potential cue to identify referents in a discourse. *Applied Psycholinguistics, 33*(2), 329-342.

Wittenburg, Peter, Brugman, Hennie, Russel, Albert, Klassmann, Alex, & Sloetjes, Han. (2006). ELAN: A professional framework for multimodality research. In *Proceedings of LREC 2006, Fifth International Conference on Language Resources and Evaluation*.

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