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Gestural augmentation in facilitating tense marker use: a pre-post comparison

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Abstract

Gestures are a part of unaided Augmentative and Alternative communication (AAC). They are more socially acceptable and are augmented along with speech by both typically developing (TD) and individuals with intellectual disability (ID). Hence, an attempt was made to examine how these gestures can be implemented as an augmentative aid. More specifically, we examine how gestures improve the comprehension and expression of tense markers for a Kannada-speaking 10.7 year-old male diagnosed with Spoken Language Disorder secondary to Borderline Intellectual Functioning. A case study design was employed as the intention was to bring in improvement in the target behaviour and not the efficacy of the gestural augmentation. Gestural mode was introduced as an augmentation along with the auditory verbal mode using elementary therapeutic procedures to improve the comprehension and expression of the targeted six verbs. A total of 8 sessions were required to train the comprehension and expression of tense markers. Gestural mode was introduced after the first four sessions, since the child exhibited difficulty in the comprehension of tense markers when the speech language pathologist solely used the auditory verbal modality. The child's responses were documented in terms of percentage of consistency for both comprehension and expression of tense markers. An improvement was observed in comprehension and expression of the tense markers within four sessions of introducing gestures as an augmentative mode. The average pre-therapy percentage for comprehension of past and future tense markers was 20 %, and the average post-therapy percentage for the same was 80%, whereas the expression showed an

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improvement from the average pre-therapy percentage of 0 % to an average post-therapy percentage of 80 % for future tense and for past tense. The average pretherapy percentage for comprehension and expression of present tense markers was 10% and 0 %, whereas the average post-therapy percentage for the same were 60% and 50 %, respectively. Thus this case study adds to the literature that augmenting verbal output with gestures will foster the comprehension and expression of language abilities. This study also reveals that AAC can be used for individuals who belong to expressive and/or supportive language groups, and thus works towards eliminating the misconception of AAC being reserved for individuals with severe disabilities.

Keywords: Gestures, Augmentation, Tense markers, Communication, AAC

1. Introduction

The primary aim of Augmentative and Alternative Communication (AAC) is to facilitate a child's communicative competence through the use of multiple communication modalities that either supplement ("augmentative") or replace ("alternative") natural speech (Light et al., 2003). AAC involves aided systems, including picture symbols, miniature objects, real objects, written words, or speech-generating devices, as well as unaided systems including gestures, body language, and sign language (Loncke, 2022). Von Tetzchner & Martinsen (1992) classified individuals who could benefit from AAC into three groups: (1) those who can understand spoken language but find it difficult to express themselves (expressive language group); (2) children who utilize AAC on temporary basis to enhance the understanding of spoken language and also to express themselves or children who speak but have difficulty being understood (supportive language group); and (3) those who use AAC as a long-term method for both receptive and expressive communication (alternative language group).

For individuals who belong to the alternative language group (Tetzchner & Martinsen, 1992), aided AAC systems are most frequently used because they provide alternative access methods such as, eye gaze or switch scanning, that accommodate fine motor impairments. These systems are also beneficial because they can be understood by non-trained listeners and often include visually represented symbols that resemble their referents, enhancing communicative clarity (Mirenda, 2001).A case study by Light et al. (2021), highlights the implementation of a personalized AAC intervention for a 3-year-old child with developmental delay and complex communication needs (CCN). Post 6 months intervention, the child showed substantial improvement in speech, language and literacy skills using gestures and signs; low tech photos, pictures, line drawings, written words, and letter cards; and mobile technology with an AAC app and keyboard. The child developed a wide range of semantic concepts and regularly used multi-word messages with increased use of grammatical structures (articles, conjunctions, etc). The child's speech became 95% intelligible to familiar adults, with notable improvements in vowel and consonant production. Also, her literacy skills surpassed those of typically developing peers. Sennott, Light, and McNaughton (2016) found that aided AAC modeling within naturalistic interactions led to meaningful gains in pragmatics, semantics,

syntax, and morphology. Findings from 17 studies using multiple-baseline or probe designs support high-tech AAC as an evidence-based practice for teaching social-communication skills to individuals with autism or intellectual disabilities, though it showed no clear advantage over low-tech AAC (Morin et al, 2018).

A multiple probe design was used in a study by Luckins et al. (2025) to assess Total Communication in three children aged 8–10 within a storytelling context. The intervention included speech, signing, VOCAs, and communication boards. All participants showed increased use of propositions and longer utterances across various communication modes. Studies emphasizing the importance of sign language and gestures that help facilitate verbal language are available, however, it has been tested less frequently in speech and language disorders. Also, the literature related to the impact of AAC in improving the communication abilities of children falling under the support language group is sparse (Daniels,1995; Jantzen, 2011).

Gestures are an unaided mode of communication utilizing spontaneous movements of hands and arms during a cognitive activity (Kita et al., 2017). It can indeed occur independently of speech (Goldin-Meadow, 2003). In typically developing children, gestures predict language development, increasing around 18 months and decreasing as verbal skills grow. Despite this decline, gestures remain in use among older children, adolescents, and adults (Capirci et al., 1996; Tellier, 2009; Özçalışkan & Goldin-Meadow, 2009; Trafton et al., 2006). Many studies also indicates that gesture serves as a significant facilitator in second language acquisition, as it aids in conveying meaning, compensating for speech limitations, and enhancing memory retention when compared to purely verbal instruction (Cao & Chen, 2017). Co-speech gestures are spontaneous hand motions that naturally follow all spoken words. They are generated in time with speech (Clough & Duff, 2020). It is used to enhance thinking and reasoning and to clarify speech expression of thoughts (Matsumoto & Hwang, 2013). Hostetter's (2011) meta-analysis demonstrated that observing gestures alongside speech significantly enhances comprehension compared to situations where no gestures are present. Many authors follow McNeill's (1992) theoretical framework, which identifies four types of gestures: (1) Iconic gestures, which visually represent the meaning of spoken words (e.g., saying "I turned the shape" while showing the rotation with a hand movement); (2) Metaphorical gestures, which resemble iconic gestures but convey abstract ideas (e.g., saying "it's the same" while extending both hands to suggest equivalence); (3) Deictic or pointing gestures, which indicate specific objects or directions, either concrete or abstract (e.g., saying "I went there" while pointing); and (4) Beats, which are rhythmic hand movements that emphasize speech without carrying specific meaning (e.g., subtle hand motions to stress certain words). A study by Lacombe et al. (2022) reports that children with intellectual disability (ID) use iconic gestures significantly more than their peers matched according to their mental age (MA), chronological age (CA) or language age (LA).

Children with ID exhibit significant difficulties in higher-order language skills involving thinking and reasoning (INSER, 2016) and difficulty in

developing rule-oriented language behavior (Abbedutto & Chapman, 2005). Hence, the usage of tense markers is found to be significantly reduced in them compared to typically developing children (Kaur, 2017). In addition, to support their reasoning and thinking skills, individuals with intellectual disability make frequent use of co-speech gestures compared to the typically developing population (Stefanini et al., 2007, 2008; Lacombe et al., 2022). Hence, this ability might have the potential to be utilised as an augmentative communication to enhance language skills such as tense markers in children with intellectual disability. Utilising the whole range of verbal language and gestures in these children facilitates more effective communication (Wagner et al., 2014).

Tense markers serve as a key syntactic tool for indicating temporal relationships. It is expressed by altering verb forms to indicate whether an action happens in the past, present, or future. Basic tenses such as past, present and future are found in many languages. According to Browns stages of language development, development of tenses begins in stage 2 and continues well in the school age years. The period of greatest acquisition is from 4 to 7 years (Brown, 1973).

Spoken in Karnataka, as well as in Andhra Pradesh, Tamil Nadu, Kerala, Maharashtra, Goa, and other parts of India, Kannada is one of the major Dravidian languages.The official designation of Kannada as a "Classical language" by the Union Government of India implies that it has been used for more than 1600 years. Kannada is a mora-timed language indicating the rythm produced by the native speakers of this language is dependent on individual morae(a unit of timing) rather than stress or syllable (Savithri, Goswami, & Kedarnath, 2007).The majority of people in urban and suburban areas use borrowed words and phrases in the spoken variety, indicating that Kannada in its current form has been somewhat influenced by English and neighbouring languages (Bhat, 2012).But there is a significant preservation of the syntactic structure of the language. There are limited studies on acquisition of tense markers in typically developing Kannada speaking children. A study by Srihari et al. (2022) found that Kannada-speaking typically developing children begin to use tense markers between the ages of 5 and 6. This development continues until age 7, with mastery generally achieved by age 8. Subbarao (1995), reported that the use of present tense markers was most prevalent among typically developing children aged 4 to 6. He also concluded that the performance of children with Intellectual disability was lower compared to the mental age matched typically developing peers with respect to the syntactic aspects of language including tense markers. Shasthry (2010) conducted a study on how 5- to 8-year-old children who speak Kundapura Kannada acquire tense markers. It was found that present tense markers appeared more frequently than other tense forms. Interestingly, some dialectal variations in how these present tense forms were used were documented. Significant simplifications of consonant-vowel combinations were observed, along with instances of vowel shortening, syntactic deviations, and semantic deviations. In the study by Chaitra et al.(2021) done on typically developing Kannada speaking children of age range 5-8 years, it has been reported that the usage of simple present tense markers were found to be higher than that of simple future and simple

past tense.In a study by Nisha and Shetty (2023) on 8-12 years old typically developing Malayalam- English speaking bilingual children, it was concluded that children acquire simple present tense first followed by simple past and simple future tense in both Malayalam and English languages.

In sum, there is limited literature on the usage of gestures as an augmentation in enhancing the linguistic abilities of children with language difficulties. In addition, intervention studies specifically addressing the usage of tense markers in the Indian scenario, including Kannada language, are severely limited. All the above literature review necessitates conducting a preliminary study on using unaided augmentative communication for children falling under the support language group. Hence, the current study aims to explore the efficacy of unaided gestural augmentation in facilitating language skills, specifically tense markers in a Kannada-speaking verbal child diagnosed with Borderline Intellectual Functioning.

2. Methodology

The following methodology was used to investigate the use of unaided gestural augmentation to enhance the comprehension and expression of tense markers in a verbal child with borderline intellectual functioning. The participant of this study was a Kannada-speaking male child aged 10 years 7 months diagnosed with Spoken Language Disorder secondary to Borderline Intellectual Functioning. The child was not under any other medical or behavioural intervention. Convenient purposive sampling was used to select a case with the following inclusionary criteria. The usage of respective gestures was the independent variable and the outcome measure of the percentage of consistency for comprehension and expression of tense markers served as the dependent variable.

Inclusionary Criteria:

(1) The child should be utilizing verbal mode of communication
(2) The level of IQ should be not less than that of Borderline Intellectual Functioning.

All required ethical approval was taken from the author's institute's ethical committee to carry out the study. However, kindly note that the committee does not provide any reference number for the same. The study followed the Ethical Guidelines for Biobehavioural Research: Involving Human Subjects (Basavaraj & Venkatesan, 2009). The parent of the participant was explained in detail regarding the procedures in the study and written informed consent was taken

1.1. Data collection and processing

1.1.1. Setting

The data were collected in a clinical therapy setting at the All India Institute of Speech and Hearing (AIISH), Mysuru, Karnataka, India, where the participant was receiving speech-language intervention. AIISH functions as a center for clinical services, research, and academics.

1.1.2. Materials

Assessment Checklist for Speech-Language Skills (ACSLS) (Swapna et al., 2015) was administered to the participant. It is a standardized checklist assessing the receptive and expressive language skills of children in the age range 0 to 6 years. The checklist has been developed and standardized on Indian typically developing children and has good reliability and validity.

This checklist is explicitly developed for preschoolers with communication disorders up to 6 years of age .But it could also be utilized with an older child with communication problem who shows delay in various linguistic domains, a e.g child whose actual age is 9 years and developmental age is 5 years. This test material has almost all linguistic components in the order of their acquisition and their use in daily conversations, with tense markers also being one among them. Each of these linguistic components are assessed as whether achieved or emerging or not achieved based on direct interaction with the child as well as based on the parental report of the same. Since working on the comprehension and expression of tense markers was the main objective of this study and since the subject of the study was a native of India, ACSLS, an Indian standardized tool which constitutes tense markers as one of the components of evaluation was utilized to evaluate the receptive and expressive language skills of the child.

1.1.3. Research design

The study utilizes a pre-post comparison design within a single case study framework. The rationale for choosing this design was its effectiveness in exploring individual development within specific contexts. It is particularly useful for studying complex phenomena through detailed observations and rich narratives focused on a single individual or relationship (Råbu & Binder, 2024).

1.1.4. Procedure

The participant was attending speech-language intervention for a duration of 3 months on a weekly twice basis (on all Tuesdays and Thursdays). Each session of speech language intervention spanned 45 mins. The study was conducted in the following way. Assessment Checklist for Speech-Language Skills (Swapna et al., 2015) was administered to the participant based on which receptive language age and expressive language age were found to be 4.1 - 4.6 years and 2.7 - 2.9 years respectively. Psychological evaluation was done by a certified Psychologist in the institute who is not a part of the research team. Weschlers Intelligence scale was utilized for the evaluation. The mental age was found to be 5.8 years and the Intelligence quotient of the child was 72. According to International Classification of Diseases 11th Revision (ICD-11), the child was diagnosed as Developmental Language Disorder with Impairment of expressive language (6A01.21),Borderline Intellectual Functioning (MB21.Y).

1.1.4.1. Pre-intervention assessment

After the administration of ACSLS and psychological assessment, speech and language intervention was initiated. The first author of this

study was the interventionist as well as the one who did the speech language assessment including ACSLS.One of the language goals taken up was to improve the tense markers (simple past tense, present continuous tense, and simple future tense).The baseline evaluation of his comprehension and expression of tense markers for the verbs known to him was done during the 1st session. The participant had comprehension and expression of Kannada verbs like /hatʃu/, and /bari/ (paste, write) and English borrowed verbs like cut, wash, open, and close but exhibited significant difficulty in expressing them using tense markers in all the three tenses.The child was not at all using any tense markers in the daily conversations. He was only using the respective verb in the sentences. For example, in Kannada to indicate "I am cutting", the verbal expression is / na:nu cut ma:ḍṯaiḍini/. However the child was expressing only /na:nu cut/ which means "I cut". In other words, instead of Subject+Verb+Tense marker (which is the standard order of sentence in Kannada language), the child was only using Subject+Verb. The baseline indicated 10-20 % comprehension of basic tense markers (simple past, simple present and simple future tense) and 0 % expression of the same. These observations are based on the direct interaction with the child and from the parental interview.

These tense markers were considered as they are reported to be easier for young children compared to other tense markers and these were the tense markers used in most of the studies done on acquisition of tense markers in Indian children (Chaithra et al., 2021; Nisha & Shetty, 2023). Hence, to improve the usage of morphological structures for future tense, present continuous tense, and past tense (/ -- ona/, /-- iḍini/, /--ajṯu/) for the known six verbs, picture cards depicting the target verbs were used as stimuli.

1.1.5. Data collection

1.1.5.1. Intervention

In the initial 3 sessions, the speech-language pathologist (first author) presented the instructions for the comprehension of tenses in auditory verbal mode only. However, the participant exhibited difficulty in understanding the concept of tenses through this mode solely. Hence, from the fourth session, the gestural mode was introduced as an augmentation along with the auditory verbal mode for improving the comprehension of tense markers by the speech-language pathologist (first author). Later, gestures were also used as a prompt in achieving the goal. The gestures employed were conventionalized gestures used in India to represent present, past and future. The participant's improvement was monitored during the intervention based on his responses during the session. As the participant improved in comprehension, gestures were also used as an augmentation and as a prompt in improving the expression of tense markers as well. In Kannada, the tense marker is added after the verb. Here the gesture was presented soon after the production of the verb to augment the verbal production of the respective tense markers. The presentation of the same is depicted in Figure 2.

With the improvement seen in comprehension and expression of tense markers, the gestures used as an augmented mode faded. After the

introduction of gestures, 4-5 sessions were required to attain the goal. In each session, five trials were given for each of the tense markers for the selected verbs. The response for the comprehension of each of the target tense markers was considered consistent if the participant was able to comprehend tense markers independently in the evoked trials in three consecutive sessions. The same criterion was followed for the expression of tense markers as well. In total, 8 sessions were taken to teach the comprehension and expression of tenses. The documentation of the responses was done during the session itself by the speech language pathologist (primary researcher) administering the treatment. This documentation was done by calculating the consistency of response in terms of percentage and this served as the dependent variable. This percentage was obtained by dividing the number of trials in which the child comprehended the tense markers correctly by the total number of trials the therapist provided (5 trials) to elicit the comprehension of tense markers for each of the 6 verbs in the session where the baseline was also obtained (first session). The same measure was obtained in the 8th session as well. Similarly, the consistency was calculated for the expression of tense markers in the first and eighth sessions by dividing the number of trials in which the child expressed the case marker correctly by the total number of trials (5 trials) provided to the child for eliciting the expression of tense markers for each of the six verbs. These consistencies are tabulated in Table 1. The trials for each verb was presented in a randomised manner so as to reduce the effect of the order of trials as a confounding variable in the consistency of results. These trials involved the child being exposed to the gesture of each tense marker of each verb five times. The mother was guided to provide home training by providing more opportunities for the child to express the trained tense markers in naturalistic situations at home (such as when the child was involved in any craft activities involving cutting, pasting gum, writing , or in daily activities such as washing hands, opening and closing tap and so on).Also, verbal feedback was taken from the caregiver regarding the child's usage of tense markers at home. The respective gestures used to augment the comprehension and expression of past, present continuous and future tense markers are shown in figure 1.

Figure 1. Gestures used for augmenting comprehension and expression of (a) past tense (b) present continuous tense and (c) future tense markers.

The arrow indicates the direction of the hand movement during the gesture.

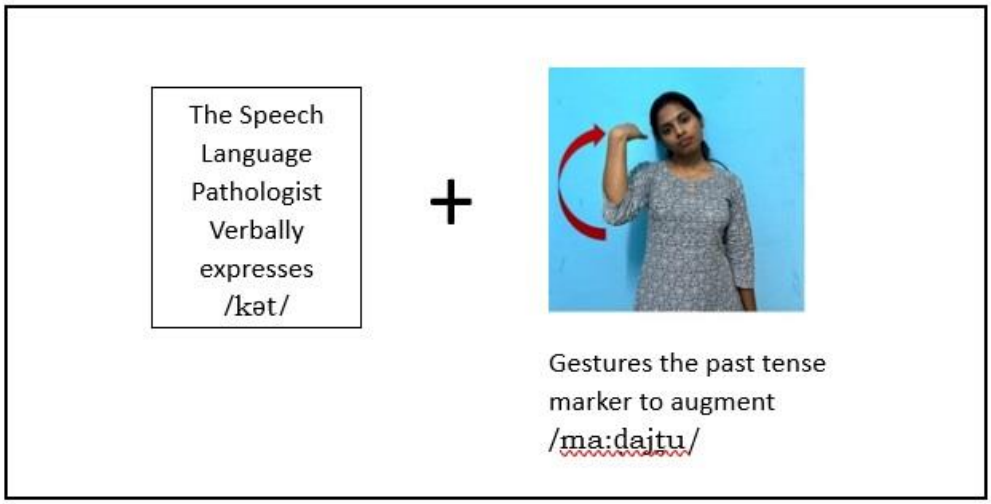


Figure 2 The presentation of gesture to augment the comprehension and expression of the past tense marker of Cut: /kəṭ ma:ḍajʈu/

1.2. Data analysis

The number of correct responses out of the five trials provided during each session and the number of sessions required to bring a change in response before and after the introduction of gestures served as the dependent variables. Each correct response was given a score of '1' and an incorrect response a score of '0'. The percentage of correct responses across the sessions was calculated and tabulated.

3. Findings

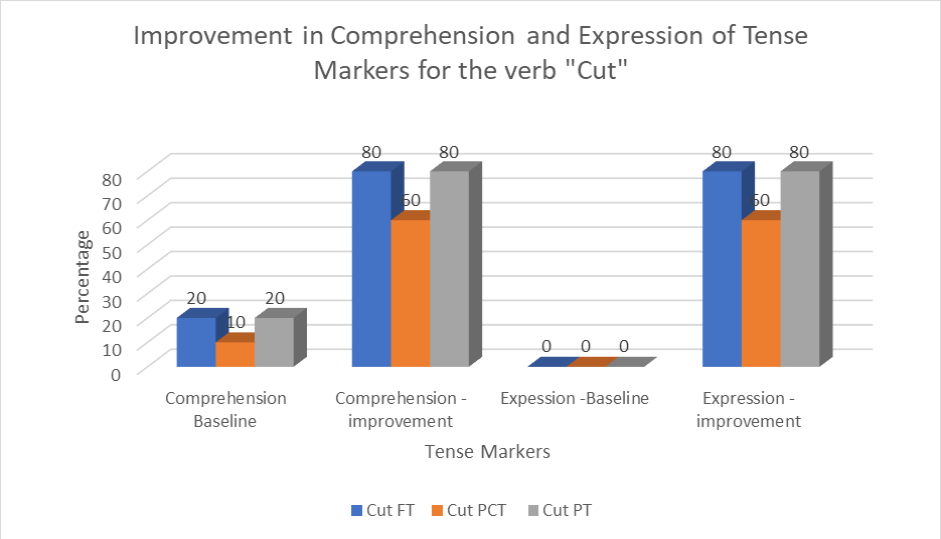
3.1. Post intervention assessment

A notable improvement was observed in terms of comprehension and expression of tense markers within four sessions of introducing gestures as an augmentative mode. Table 1 shows the comparison of the comprehension and expression abilities of the participant in tense markers before and after the usage of gestures as an augmentative communication mode.

Figures 3 to 8 illustrates the improvement in comprehension and expression of the Tense Markers for the verbs. From the Figures 1 it can be understood that the baseline comprehension of the Tense Marker for the verb "Cut" was 20 % for both Simple future and Simple Past Tense. The comprehension for the Present Continuous Tense of the verb "Cut"at the baseline was found to be 10 %. Post intervention, both the comprehension and expression of Simple future Tense of this verb was observed to be improved to 80% consistency. The comprehension of Present Continuous Tense improved to 60 %, the expression of the same also improved to 60 %. For the past tense marker, the improvement was found to be 80% % for both comprehension and expression. The graphs for other verbs can also be interpreted in similar manner.

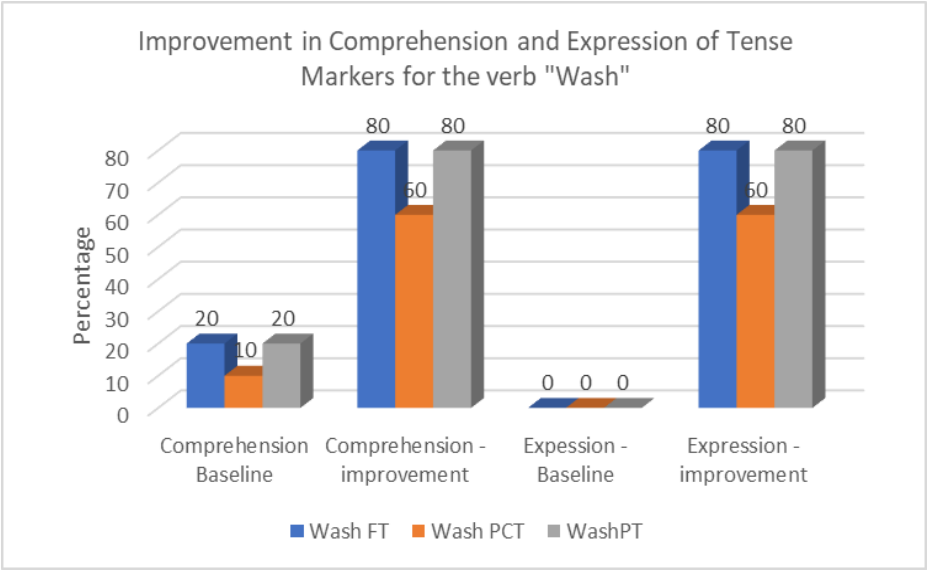
The child was not at all expressing any of the tense markers of these verbs in the baseline evaluation. Hence the consistency of expression of all

the tense markers at the baseline was marked as 0%. After providing language intervention augmented with the respective gestures, there was a remarkable improvement noted in both comprehension and expression of all the three tense markers.



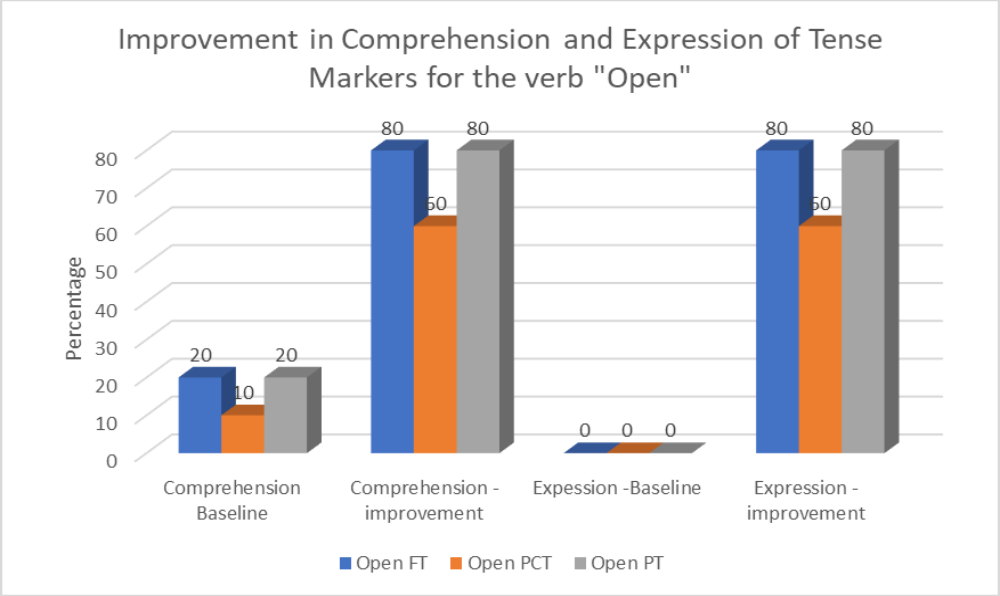
Note: FT- Future tense; PCT- Present continuous tense; PT- Present tense

Figure 3 Improvement in comprehension and expression of Tense Markers for the verb " Cut"



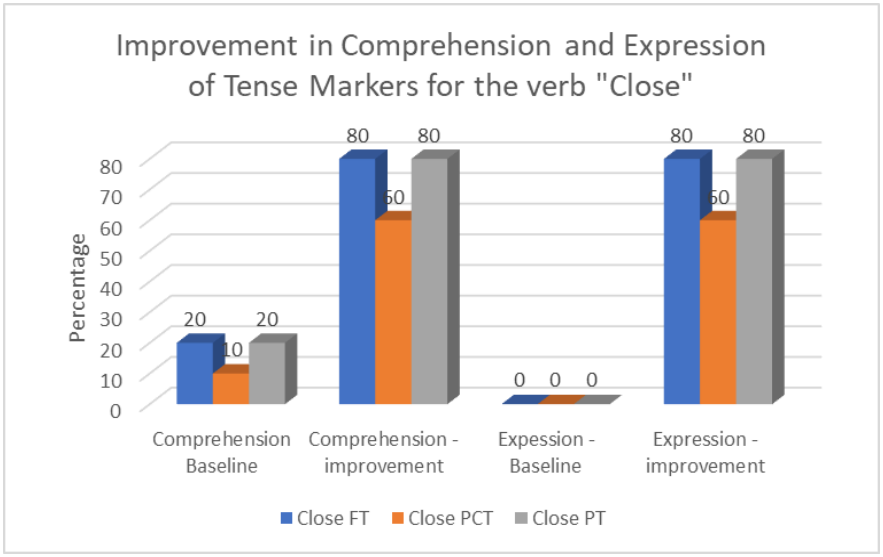
Note: FT- Future tense; PCT- Present continuous tense; PT- Present tense

Figure 4 Improvement in comprehension and expression of Tense Markers for the verb " Wash"



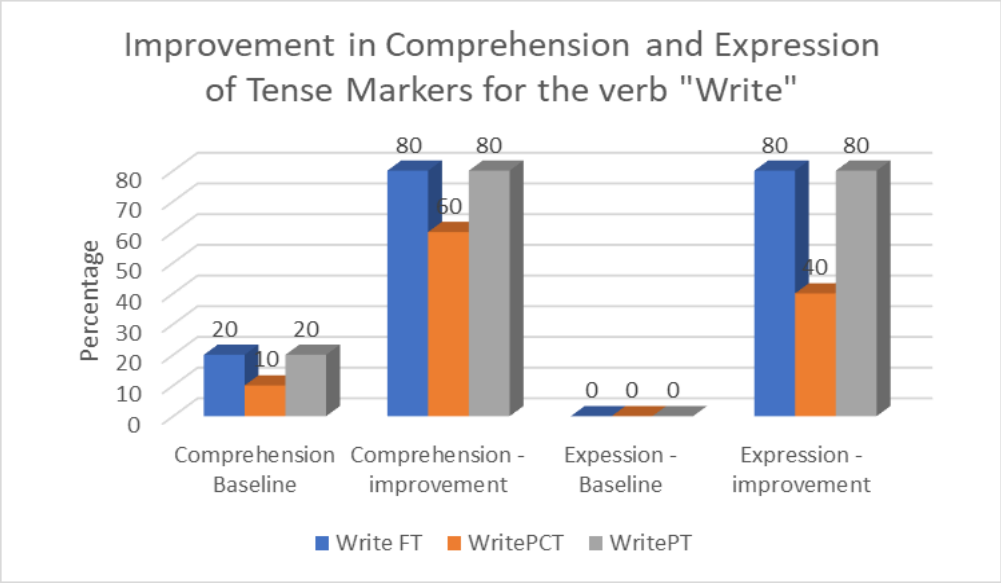
Note: FT- Future tense; PCT- Present continuous tense; PT- Present tense

Figure 5 Improvement in comprehension and expression of Tense Markers for the verb " Open"



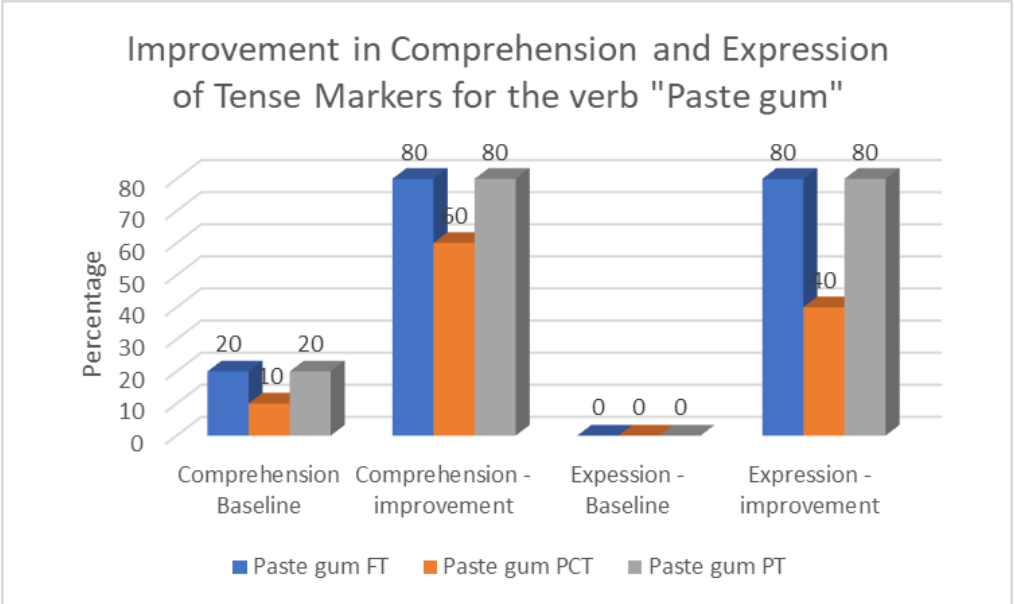
Note: FT- Future tense; PCT- Present continuous tense; PT- Present tense

Figure 6 Improvement in comprehension and expression of Tense Markers for the verb " Close"



Note: FT- Future tense; PCT- Present continuous tense; PT- Present tense

Figure 7 Improvement in comprehension and expression of Tense Markers for the verb “Write”



Note: FT- Future tense; PCT- Present continuous tense; PT- Present tense

Figure 8 Improvement in comprehension and expression of Tense Markers for the verb “Paste gum”

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Table 1
The baseline and the improvement in comprehension and expression of tense markers

Target	English Translation	Tense	Comprehension – Baseline (%)	Comprehension – improvement after using gestures (%)	Expression- Baseline (%)	Expression – Improvement after using gestures (%)	No of sessions required after the introduction of gestures
/kəṭ **ma:dona**/	Shall cut	Future tense	20%	80%	0%	80%	4
/kəṭ **ma:ḍṯaiḍini**/	I am cutting	Present continuous tense	10%	60%	0%	60%	5
/kəṭ **ma:ḍajṯu**/	Have cut	Past tense	20%	80%	0%	80%	4
/va:ʃ **ma:dona**/	Let's wash	Future tense	20%	80%	0%	80%	4
/va:ʃ **ma:ḍṯaiḍini**/	I am washing	Present continuous tense	10%	60%	0%	60%	5
/ va:ʃ **ma:ḍajṯu**/	Have washed	Past tense	20%	80%	0%	80%	4
/opəṇ **ma:dona**/	Let's open	Future tense	20%	80%	0%	80%	4
/ opəṇ **ma:ḍṯaiḍini**/	I am opening	Present continuous tense	10%	60%	0%	60%	5
/ opəṇ **ma:ḍajṯu**/	Have opened	Past tense	20%	80%	0%	80%	4
/klos **ma:dona**/	Let's close	Future tense	20%	80%	0%	80%	4
/klos **ma:ḍṯaiḍini**/	I am closing	Present continuous tense	10%	60%	0%	60%	5

/ klos **ma:ḍajʈu**/	Have closed	Past tense	20%	80%	0%	80%	4
/bari**jona**/	Let's write	Future tense	20 %	80%	0%	80%	4
/bari**ʈaiḍini**/	I am writing	Present continuous tense	10 %	60%	0%	40%	5
/bar**da:jʈu**/	Wrote	Past tense	20 %	80%	0 %	80%	4
/gum **hatʃona**/	Let's put gum	Future tense	20 %	80%	0%	80%	4
/gum **hatʃʈaiḍini**/	I am putting gum	Present continuous tense	10 %	60%	0%	40%	5
/gum **hatʃa:jʈu**/	Have put gum	Past tense	20 %	80%	0 %	80%	4

4. Discussion

From the results, it can be inferred that there was an acceleration in the comprehension and expression of tense markers after the introduction of the gestural mode along with the verbal modality. This is in consensus with the previous studies which indicate the fact that unaided AAC interventions appear to facilitate the development of speech (Millar et al., 2006). In addition, the participant had cognitive skills sufficient to understand the simple gestures and was motivated to attend speech language intervention sessions (this is based on the researcher's observation of the child's responses during the intervention sessions). In terms of home training, the mother was also facilitative in providing adequate support to the child. Verbal feedback was taken regularly from the mother regarding the performance of child at home and the speech language pathologist provided suggestions regularly so as to elevate the quantity and quality of home training. The child's adequate comprehension skills enabled him to understand the co-speech gestures used by the speech-language pathologist, which may have further reinforced their meaning.

There is a dearth of literature addressing the language intervention specifically for tense markers in Indian languages including Kannada. However, there are a couple of studies done in English language regarding language intervention improving the usage of tense markers in children diagnosed with various language disorders. In a study by Calder et al.(2021), an improvement was observed in the usage of past-tense markers in children of age range 5.9 years of 6.9 years , diagnosed with Developmental Language Disorder (DLD), on using visual cues to train the expression of the same. The visual cues involved the representation of morphological features using colours, shapes and arrows where colour coding was used to symbolise the parts of speech. Owen Van Horne et al. (2017) assessed a largely implicit intervention that targeted regular past tense production over the course of up to 36 intervention sessions in a randomized controlled trial (RCT) including 18 children ages 4 to 10. The children in the past tense verb condition made larger improvements on untrained verbs with a large effect. The results showed that learning more complicated past tense verbs had benefits. The effectiveness of enhanced recasting in enhancing regular past tense for 20 children with DLD, ages 4.8 to 6.7 years , was investigated by Eidsvag et al. (2019). Children were delivered therapy once a day for five days throughout five weeks, either individual or as group therapy. The mean improvement on past tense morphemes for both delivery situations was found to be significant. These studies did not employ the usage of gestures as an independent variable to bring about a change in the usage of tense markers. In the current study, an improvement in the usage of all three tense markers was brought in the child through the use of gestures, thereby demystifying the potential of gestures in facilitating and augmenting the comprehension and expression of tense markers.

It can also be deduced from the Figure 1 to Figure 6 that the consistency of the tense marker of the present continuous tense was lower than the future and past tense for all target verbs. The following reasons might have contributed towards the lower consistency. One of the reasons might be the relative lack of iconicity in the present tense gesture as

compared to the past and future tenses. Whereas the past tense clearly denotes 'back', and the future clearly denotes 'forward', the present tense gesture is more opaque. An equally iconic gesture, can be explored in the future studies. Also in the current study, we analyse this lower consistency with respect to the syllable structure of the respective tense morphemes. In Kannada, the simple past tense is marked by adding the morpheme "aitu"(VVCV) (C stands for consonant and V stands for Vowel), present continuous tense can be marked by adding the morpheme "taidini" (CVVCVCV) and simple future tense is marked by adding the morpheme "ona"(VCV) .Thus the syllable structure for present continuous tense is more complex than the tense marker for simple present and simple past tense in Kannada language. For example, for the root word /bari/ (write), the past-tense form is /bardaitu/(wrote), present continuous tense is /baritaidini/(writing) and future tense is /bariyona/ (will write) with CVCCVVCV, CVCVCVVCVCV and CVCVCVCV syllable structures respectively. This demonstrated a longer and more complex syllable structure for the present continuous tense, hence making it relatively difficult for the child to produce a present continuous tense marker. The studies by Subbarao (1995); Shasthry (2010); Chaitra et al. (2021); Nisha and Shetty (2023) have employed simple present tense and not present continuous tense. The present continuous tense in Kannada has more complex syllable shape than the simple present tense. This might be the reason the consistency of the present continuous tense marker was lower than the other tense markers in the current study unlike the other studies. However further studies are required to validate and establish this comparison.

Case studies are still highly popular among researchers in spite of the existing difference in opinion about the reliability and drawbacks of case studies, particularly regarding generalization, reproducibility, and bias from the researcher side (Thomas, 2011; Hyett, Kenny, & Dickson-Swift, 2014).This was a case study with one participant. Hence, the results need to be validated by conducting the study with a higher sample size. There are few other limitations for this study as well. Notably, it did not include a follow up assessment, which limits the ability to evaluate whether the improvements were sustained over time. Also, in the current study the data was documented only with respect to the overall performance in the trials given and the variation of performance in consecutive trails were not considered. In future studies, more detailed documentation can be incorporated where, specifically, for each verb form, it can be reported if three or more successive trials were 'correct' or not as well as where the trials fall within the 5 total. The current study did not employ a detailed qualitative analysis. The quantitative analysis of responses can be accompanied by qualitative analysis also to strengthen the future case studies. This may help to understand how learning occurred for each verb form, rather than for the tense overall. Also, the study can be extended to other higher-level linguistic goals. Further, it can be applied to children with various other communication disorders like autism, developmental language disorder, apraxia, and so on. These populations often experience challenges with morphosyntactic development and may face difficulties in acquiring and

generalizing grammatical structures (Moraleda-Sepúlveda & López-Resa, 2022; Reis & Teixeira, 2012).Further, this study is an example indicating that incorporating or augmenting even a simple conventional gestures in speech-language intervention session may expedite the process of learning in individuals with special needs.

5. Conclusion

The study indicates that the use of gestures as an augmentative aid does improve the comprehension and expression of higher-order language aspects. Also, this study aids in dispelling the myth that AAC is not only used for children with CCN, in fact, it can also be used for support language groups.

In sum, augmenting verbal output with gestures may foster the comprehension and expression of language abilities in children with intellectual disability. Further, there is no candidacy to use AAC and be implemented for those who are expressive in nature as well. This preliminary case study highlights initial findings that should be validated through further research with a larger sample size.

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