The Kata Kolok perfective in child signing: Coordination of manual and non-manual components[1]

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1. The acquisition of multi-channelled syntactic structures

In spontaneous language use, signers and speakers alike recruit multiple articulators such as the hands, body, and face to produce composite utterances (McNeill 2000; Kendon 2004; Enfield 2009). Moreover, in the case of sign languages, facial expressions, head and shoulder positions and other non-manual signals are fully integrated into the grammar alongside manual components (Sandler & Lillo-Martin 2006). As a result, many syntactic constructions require the coordination of multiple articulators. For example, in the expression of questions, both manual *wh*-signs and furrowed brows indicate content questions in a number of sign languages, see for instance Baker-Shenk (1983) on American Sign Language; Bergman (1984) on Swedish Sign Language, and Coerts (1992) on Sign Language of the Netherlands. Similarly, a multitude of sign languages marks negation by using manual and non-manual forms in concert (Zeshan 2004). This paper revolves around the acquisition of one such simultaneous structure: the syntactic marking of perfective aspect. In Kata Kolok – a village sign language of Bali, the full form of the perfective particle is produced with two 5-hands rapidly turning palm upward along with a lip smack glossed as 'pah'.

The existence of multi-channelled syntactic structures poses unique challenges to the acquisition of sign languages. In particular, children acquiring sign languages need to learn to coordinate manual and non-manual forms in order to produce well-formed utterances (Reilly & Anderson 2002). One methodological issue in this story is that many non-manual forms find their origins in the co-speech gestures also used by the wider hearing community. Deaf children can therefore produce communicatively valid forms, which are also used by hearing individuals, but which are not fully integrated into their linguistic system. For instance, Anderson & Reilly (1997) found that, while deaf and hearing children use negative headshakes by the one year mark, deaf children do not start to use manual negative forms until 18–20 months.

Moreover, this manual form is not accompanied by non-manual marking until one to eight months after its first occurrence. Anderson & Reilly interpret this first co-occurrence as evidence for a reanalysis of the gestural negative headshake, which is common to both the co-speech gestures of American English speakers and American Sign Language users, as part of linguistic negation within American Sign Language.

In the production of *wh*-questions, too, children do not initially use the appropriate facial expression, resulting in utterances that are ungrammatical in adult users of American Sign Language. Specifically, Reilly & McIntire (1991) showed that, although toddlers use furrowed eyebrows to express puzzlement, deaf children initially produce *wh*-questions solely through manual signs (e.g., WHAT, WHERE) with no accompanying facial expression. The appropriate non-manual marking, furrowed brows and a head tilt, is on average delayed by more than one year. Based on these and other studies, Reilly (2006) generalises that in the acquisition of multi-channelled linguistic structures, the use of the manual forms precedes the use of coordinated non-manual morphology. She does not indicate however, which mechanism may underlie this observation. In my view, the delayed use of non-manual marking of *wh*-questions may be related to the input that deaf children receive through child-directed signing. That is, Reilly and Bellugi (1996) found that in more than 90% of the *wh*-questions that were signed to toddlers younger than 2 years old, deaf mothers did not use the standard furrowed eyebrows. According to Reilly and Bellugi, deaf mothers might have chosen to use neutral and raised eyebrow position as an alternative because furrowed eyebrows are associated with anger. All in all, the omission of potentially confusing non-manual marking in child-directed signing might explain the delay in the acquisition of such features by deaf children acquiring American Sign Language.

The studies on the acquisition of coordinated manual and non-manual forms in American Sign Language leave a number of questions unaddressed. It is conceivable, as state above, that the delayed acquisition of these simultaneous structures could have resulted from the input that these children received, that is to say, from the specific characteristics of child-directed American Sign Language. Alternatively, the coordination and integration of non-manual morphology may be mediated by the acquisition of manual forms more generally, in which case patterns are expect to hold across diverse structures and sign languages. This paper addresses this issue by looking at the distribution of non-manual and manual forms of perfective aspect in spontaneous signing produced by a deaf child acquiring Kata Kolok. As described above, the Kata Kolok perfective is essentially a coordinate

manual/non-manual structure that combines a lip smack with one or two 5-hands rapidly turning palm upward.[2] In adult Kata Kolok, this combined form (FINISH#pah) is highly salient both in terms of frequency and through its use in greeting practices. The non-manual form 'pah' may also function as a bound morpheme that combines with lexical predicates and pointing signs, but this latter usage is marginal in the adult Kata Kolok corpus.

Aspect is possibly one of the most thoroughly researched areas of language development and its acquisition interacts with many linguistic factors. The overview presented below is primarily based on van Hout (forthcoming). The most prominent interaction is probably with lexical aspect, defined by the semantics of the predicate. One such semantic dimension is whether the predicate describes a telic event - an accomplishment or achievement, or an atelic event – a state or process. A typical atelic predicate is 'sleep', and good example of a telic predicate is 'wake up'. Corpus studies have indicated that children use aspectual markers at an early age, but that they initially produce perfective markers with telic predicates, and imperfective markers with atelic ones, presumably because of their semantic affinity. These findings indicate that children may not have fully grasped the meaning of these grammatical markers independent of the predicate. Furthermore, a multitude of studies have indicated that, while children may exhibit adult production patterns, their comprehension may be severely delayed (van Hout forthcoming). Languages mark aspect in different ways, including: verb morphology, analytical constructions, and particles (van Hout forthcoming). As mentioned above, Kata Kolok marks perfective aspect by the particle FINISH#pah, and it is similar in this respect to Mandarin Chinese. Li & Bowerman (1998) showed that in this language, the comprehension of aspect does not reach adult levels until the age of 5. The child under consideration in this study is 24–36 months, and for these and other reasons, the present paper is inherently limited in its generalizations and essentially constitutes a pilot study. Taking this cautionary note into account, the paper represents the first developmental study in a village sign language and raises a few new issues as such.

The structure of this paper is straightforward. Section 2 presents a brief overview of the sociolinguistic facts that are most relevant to the acquisition of Kata Kolok. Before providing a grammatical analysis and examples of perfective aspect in section 4, section 3 describes the Kata Kolok corpus and the linguistic fieldwork on which this description is based. Section 5 explores the distribution of manual and non-manual perfective forms produced by a deaf child acquiring Kata Kolok. The conclusion, Section 6, emphasises how the comparative acquisition of sign languages, in particular of typologi-

cally different ones, could considerably advance our understanding of the modality-specific and language-specific aspects of first language acquisition.

2. Growing up in Bengkala: a deaf village in Bali

Kata Kolok is a sign language that is indigenous to a village community of Bali, which has had a high incidence of deafness due to a recessive gene that has spread throughout the community (Winata et al. 1995). Genetic research indicates that the mutation that causes deafness first occurred between approximately four and nine generations ago (Winata et al. 1995). Notwithstanding the biological time depth of this mutation, the first substantial cohort of deaf signers did not appear until five generations ago, and this event marks the emergence of Kata Kolok (de Vos 2012). Furthermore, similar to Kisch' description of the Al-Sayyed Bedouin community (see Kisch, this volume), deaf adults in Bengkala are not always easily assigned to a single generation because their parents may have been born into different generations, and their peers belong to different generations as well (de Vos 2012). The grammatical description of perfective aspect in Kata Kolok, which is presented in section 4, is primarily based on corpus analyses of deaf signers of the fourth biological generation of signers, who are currently between twenty and sixty years old. The acquisition data stem from a child from the youngest generation of Kata Kolok signers.

In the year 2000, the village of Bengkala was home to 2,186 individuals, of whom 47 were deaf (Marsaja 2008). Based on a linguistic survey conducted in that same year, we learnt that as many as two-thirds of the hearing community members use Kata Kolok, albeit with varying degrees of proficiency (Marsaja 2008). A demographic survey conducted in 2008 has indicated that the village population has increased to 2,740 (Astika 2008). Assuming that the proportion of hearing signers has remained constant, Kata Kolok could be currently used by up to 1,800 hearing signers. Furthermore, a fieldwork visit by the author in September 2011 has indicated that only 38 out 46 deaf individuals born into the community are permanently based within the community (see also the socio-linguistic sketch of Kata Kolok in this Volume). The overall ratio of deaf to hearing signers in Bengkala could thus be estimated as 1:47.

Due to the high proportion of signers in the village, deaf children grow up in a linguistic setting quite similar to hearing children, in terms of acquiring language from birth. Usually their parents can sign, in addition to most of their neighbours and the children they play with. Furthermore, ethno-

graphic observations of Kata Kolok have revealed the existence of a special register for child-directed signing (Marsaja 2008; see also Nonaka 2004 on child-directed signing in Ban Khor Sign Language). There are currently no existing studies of first language acquisition in such a uniquely rich signing environment, and for this reason, documentation activities by the author have systematically included child signing data (see section 3). Because this language acquisition setting is optimally similar to the native acquisition of spoken languages, differential developmental stages are more easily attributed to differences in the language modality, that is to say to the physical constraints of the organs involved in language production and perception.

In recent years, multiple deaf teenagers from Bengkala have entered the deaf boarding schools in Bali. These adolescents have become fully bilingual in Indonesian Sign Language and Kata Kolok, and such contact situations often result in linguistic change in favour of the majority language associated with perceived educational and professional opportunities. Attendance at this deaf boarding school has also resulted in increased contact between the Kata Kolok community and the larger deaf community of Bali, resulting in changing marital patterns. That is, the intensification of contact between the Kata Kolok signers and Indonesian Sign Language users has also resulted in an increasing number of deaf individuals from Bengkala seeking out deaf spouses from surrounding villages and other parts of Bali. Because deaf individuals outside of Bengkala are not carriers of the identical recessive gene causing deafness, these couples are unlikely to bear deaf offspring (de Vos 2012).

Moreover, this latter tendency, to marry outside the village, is also observed in hearing villagers from Bengkala due to recent socio-economic changes. That is to say, an increasing number of hearing community members has found employment in the tourist industry in the South of Bali, and they end up marrying individuals from other parts of the island. In effect, these changing marital patterns dilute the prevalence of the recessive gene in the population of Bengkala and the incidence of deafness as a result. Even though Kata Kolok is still used by hundreds of hearing signers, chances are that the communicative need for the sign language will rapidly disappear when the number of deaf individuals decreases significantly. Since 2005, no deaf children have been born to parents using Kata Kolok, and this makes the study of its acquisition especially pressing, as another opportunity to study the acquisition of this endangered sign language without the influence of Indonesian Sign Language may not readily occur (de Vos 2012).

Interestingly, in response to this imminent threat, the Deaf Alliance – a team of deaf and hearing villagers who advocate the interests of the deaf villagers

and their relatives – have supported the establishment of Kata Kolok-based deaf education. This inclusive education programme takes the form of a deaf unit within one of the village's elementary schools and is currently attended by eight deaf children (including those described below). In general classes such as religion and gymnastics, the deaf children join the hearing classrooms, but in math and literacy they are exclusively taught within the deaf unit. This deaf unit has been supported by regional and national governments since 2007. Initial observations indicate that Kata Kolok's lexicon is rapidly expanding, presumably because of increased contact with Indonesian, and the youngest deaf children are among the first generation to receive speech therapy. The initiation of deaf education may thus prove to have a profound impact on Kata Kolok's lexicon, and perhaps prompt the emergence of other contact-induced features, such as mouthings (cf. de Vos 2011). At any rate, the sign language use of this youngest generation of signers embodies the locus of linguistic change of this remarkable sign language.

3. Corpus analysis

3.1. Linguistic fieldwork & corpus construction

Over the past five years, the author has spent 12 months in Bengkala, during which she interacted with deaf signers on a daily basis.[3] She has participated in Hindu ceremonies and deaf gatherings, and initiated the establishment of the deaf unit within the village's elementary school (Kortschak 2010; de Vos 2012; de Vos & Palfreyman forthcoming). This type of participatory linguistic fieldwork allowed her to familiarise herself with local customs, and acquire sufficient fluency in the language. During this time she also coordinated the creation of a digital archive of the language: 100 hours of video data capturing the main contexts in which the language is used. The Kata Kolok corpus currently includes spontaneous video recordings of all deaf Kata Kolok signers as well as a number of hearing signers. This digital repository covers a wide variety of data: culturally entrenched narratives of deaf ghosts, the Bali bombings, and Balinese cock fights in multiple participant configurations; stimulus-based elicited signing; and a special section devoted to child signing.

The documentation of Kata Kolok has resulted from the joint efforts of multiple individuals, not in the least the deaf and hearing community members of Bengkala who agreed to be recorded. Ketut Kanta was born and raised in Bengkala and is a fluent Kata Kolok signer. As a research assis-

tant he made many video recordings, including longitudinal recordings of multiple deaf children within the village (more detail is provided below). Ketut Kanta has also provided sentence-level translations of a number of the video recordings. English translations of these Indonesian transcripts were provided by Febby Meilissa - a research assistant at the Jakarta Field Station of the Max Planck Institute for Evolutionary Anthropology. It is hoped that these Indonesian and English translations will make the corpus accessible to a national and international (academic) audience in future. The digitisation of all video recordings has been facilitated by Nick Wood and supported by the Max Planck Institute for Psycholinguistics. All data have been deposited by the author and have since been jointly archived by the Max Planck Institute for Psycholinguistics and the International Institute for Sign Languages and Deaf Studies. The video files are also stored locally within Bengkala's village administration.

As mentioned above, a special section of the Kata Kolok corpus targets child signing. From mid-2007 until mid-2009, recordings were made of two deaf children born into deaf families, who were aged 23 and 24 months at the time of the first recording. The parents and older siblings of each child are native Kata Kolok signers. All child signing recordings were made by Ketut Kanta, who has known the deaf families in the village for many years and has worked with them on several occasions. Consequently, he is a familiar face for the children involved in this project, and thus particularly well suited to make the recordings. During the course of the project he has also become the main teacher of the deaf children at the village's school, which was set up in July 2007 in collaboration with local authorities (de Vos & Palfreyman forthcoming). Recordings were made once or twice a month in systematically varied situations: interacting with a parent or caregiver, interacting with each other or with other deaf and hearing children, and in free play. Each recording session lasted on average half an hour. This resulted in approximately 50 hours of video data of the children between the ages of 23–49 months and 24–48 months.

3.2. Selected data and transcription

Adult data. The description of temporal aspect in Kata Kolok in section 4 is based on analyses of the section of the Kata Kolok corpus that features spontaneous signed conversations of exclusively deaf (native) signers. The frequency of the perfective marker was determined on the basis of a subset of those corpus files that had been transcribed in detail. These files comprise

various participant configurations, including five monologues, seven two-participant conversations between signers who have intimate knowledge of each others' lives, and one group conversation. This data set totals six and a half hours of densely transcribed video data, with thirteen different signers represented. The corpus analyses have also been supplemented by ethnographic observations that were made by the author during the extensive periods of fieldwork.

Child data. Due to space considerations, the present study focuses on montly video recordings of one child (henceforth Child 1), between the age of 24 and 36 months. A total of 5.5 hours were selected: 164 minutes between 24–30 months of age and 164 minutes between 32 and 36 months. Due to technical difficulties at the field site no data is available at 26 and 31 months of age.

The initial parts of the video file names presented throughout the paper refer to the entire video file as it was added to the Kata Kolok corpus. Based on this, the reader can thus consult metadata on that file by viewing the corpus online at the following URL: http://corpus1.mpi.nl, and by subsequently navigating to the relevant section by opening the following corpus branches: Sign Language, Sign Language Typology, Village Sign Languages, Bali, Vos, Kata Kolok, Child Signing, Longitudinal, Deaf Children, Child 1.

Both the adult and child signing data presented in this paper are based on corpus transcriptions that were made by the author. These transcription activities were greatly facilitated by the Indonesian and English translations provided by Ketut Kanta and Febby Meilissa as well as the author's own knowledge of the language. The data have been annotated and coded using ELAN annotation software, which is freely available at http://www.lat-mpi.eu/tools/elan. ELAN enables the researcher to make time-aligned video annotations on multiple tiers, which can be created and arranged according to the nature of the research questions. The coding scheme that has been used throughout the Kata Kolok corpus is based on the transcription format developed by the Sign Language Typology Group at the Max Planck Institute for Psycholinguistics in Nijmegen in June 2005.[4]

4. Perfective and imperfective aspect in Kata Kolok

Linguistic tense refers to the timing of an event in terms of future, present or past. The English *–ed* marker, for instance, transforms a verb into a past tense form. In Kata Kolok tense is not marked on verbs (de Vos 2012).

From a cross-linguistic perspective this is not surprising; there are not many reports on the marking of tense on verbs in sign language literature (but see Jacobowitz & Stokoe 1988; Schermer & Koolhof 1990; Sapountzaki 2007), and additionally, many spoken languages lack past and future tense marking (Dahl & Velupillai 2011a-b). In contrast to grammatical tense, which marks a past/future distinction, perfective/imperfective aspect is primarily concerned with whether or not an event is completed (for a short introduction to the distinction between tense and aspect see Dahl & Velupilai 2011d). In a sample of 222 spoken languages, aspect is marked grammatically in nearly half of the cases, and aspectual systems are not uncommon to sign languages either (Dahl & Velupillai 2011c; Sandler 1990; Zeshan 2003).

In South-East Asian Languages, perfective aspect markers are frequently derived from content words that mean 'finished, already', and this is also the case in Indonesian (*sudah*) and Balinese (*telah*) - the spoken languages that are in cross-modal contact with Kata Kolok (Dahl & Velupilai 2011c). In Kata Kolok, too, temporal aspect revolves around the perfective/imperfective distinction. The perfective marker FINISH#pah is elsewhere identified as a completive aspect and is expressed by a sign that also means 'finished, already' (de Vos 2012). Marsaja (2008:201) previously described the sign KONDEN 'not-yet' in Kata Kolok as a negative completive. This manual form is glossed as NOT-YET in this paper, and it is formed by a B-hand making a downward movement. The present paper adopts the terms perfective and imperfective respectively, in line with the literature on spoken Balinese and Indonesian and the literature on the acquisition of aspect. The analyses presented in this paper will focus on the marking of perfective aspect as corroborated by the corpus analyses described below and verified by intuitions of various native and fluent Kata Kolok signers.

In its full form, the sign FINISH is produced with two 5 hands rapidly turning palm upward along with a lip smack glossed as 'pah'. In phonetic terms this lip smack is a bilabial glottalised ingressive. Figure 1 below illustrates the initial and the final position of the full form. Neither the manual perfective marker nor its non-manual counterpart 'pah' have been observed in Balinese co-speech gesture, and they do not have any transparent non-linguistic communicative function. When acquiring the appropriate uses of the perfective marker the child thus relies on the syntactic distribution that is specific to Kata Kolok, and cannot rely on gestural uses of these forms. As becomes clear from the figure, the final mouth position of the perfective marker vaguely resembles the mouth aperture in the pronunciation of *sudah* and *telah* and might therefore be considered a mouthing – a meaningful

mouth movement derived from a spoken word. In the perception of a number of hearing Kata Kolok signers, however, the overlap between these forms seems incidental. Moreover, the lip smack in itself has telic characteristics in terms of its abrupt production. It is presumably this temporal iconicity that has motivated the use of a very similar form as an adverb meaning 'finally!' in American Sign Language as well (Anderson & Reilly 1998). Unlike Kata Kolok, however, the American Sign Language form PAH! has not been analyzed as a perfective marker, and PAH! is not linked to the American Sign Language form of FINISH in any way.

In adult Kata Kolok signing, the perfective marker is most frequently produced with one hand, but is accompanied by the non-manual component without exception. As will become clear in section 5, the coordination of the manual and non-manual components of this grammatical marker constitute a challenge to the child under consideration here.

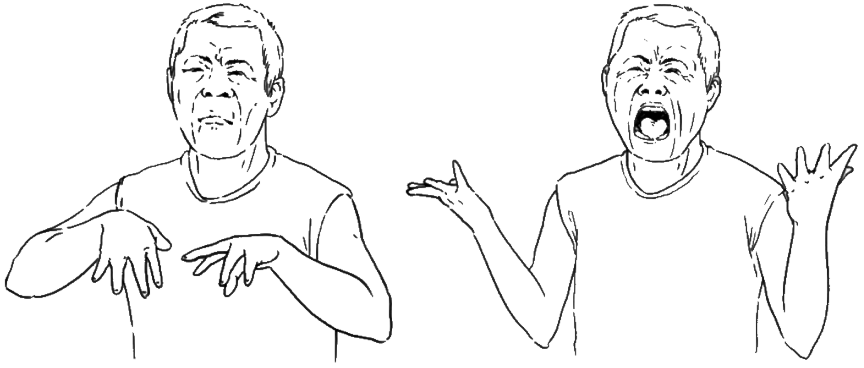

Figure 1. The initial and the final frame of the full perfective aspect marker

The perfective marker forms a crucial component of daily greetings among the inhabitants of Bengkala. In the early evening, the villagers take their *mandi* 'bath' and have dinner before visiting their relatives and friends for a chat. Upon arrival, and rather than asking how one is doing, a polite way of greeting someone is to ask whether they have had their baths yet, and whether they have had their dinners yet.[5] Both questions are formed respectively by producing the signs EAT and BATH alongside raised eyebrows and a nod. The designated response is a one-handed FINISH#pah. In addition to the prominent use of FINISH#pah in these greetings, the sign is also extremely frequent in spontaneous language use. The analysis of six and half hours of spontaneous Kata Kolok discourse has identified 272 instances of FINISH#pah in a total of 10,106 manual signs. With an incidence of 2.7%,

FINISH#pah is the third/fourth most frequent sign in the corpus alongside the general negation marker NEG. The sections below present further types of discourse contexts in which the perfective marker is used.

An instance of use of the full form is illustrated below by Example 1. Before explaining this signed example in detail, the transcription conventions adopted in this paper are briefly addressed. The glosses throughout this paper are presented on three independent rows: firstly, NM (Non-Manual) indicates non-manual signals such as facial expressions and body movements; secondly, MG (Main Gloss) is used for signs produced by the dominant hand, or signs that are two-handed; and thirdly, signs produced with the non-dominant hand are presented on the bottom row ND (Non-Dominant hand). In line with conventions used in the field of sign language linguistics, glosses for lexical signs are presented in capital letters. The transcription on multiple independent rows allows for the visual representation of simultaneous signals in the signed sentences. The initial pointing sign in Example 1, for instance, is produced with raised eyebrows (rb). When simultaneous signals are described in the text the # symbol is used. The simultaneous uses of the non-manual and manual parts of the perfective aspect marker are thus indicated as FINISH#pah.

Returning to this fully-fledged form, Example 1 presents an extract of a story about a motorbike accident in which two deaf men died. The signer, the father of one of these men, has just described how his son died directly following a collision with the truck. The other man, a Muslim friend of his son, did not die until a few days later in the hospital. The signer explains that after the accident the injured man was taken to the hospital in the nearest city of Singaraja and was given intravenous fluid. Despite the doctors' best efforts, the man passed away in the hospital after five days.

Example 1

NM	rb			pah
MG	IX'Singaraja'	STICK-NEEDLE	INFUSION++	FINISH
ND				

'There (at the Singaraja hospital), he was given intravenous fluid.'

NM		pt
MG	COUNTING'one, two, three, four, five'	DIE
ND		

'After five days, (the deaf Muslim) also died.

FINISH_Gta6oct7.mpg

When the non-manual perfective marker is attached to a lexical predicate, it can occur without the manual part. Conversely, the manual part of the perfective does not occur without the non-manual component in the spontaneous corpus of adult Kata Kolok signing. In Example 2 the signer combines the sign GO-FROM-HERE-TO-X with the non-manual component of the perfective marker, which has been glossed as 'pah'. The example comes from a narrative about an encounter with a deaf ghost (see also the socio-linguistic sketch of Kata Kolok in this Volume). Although the ghost was deaf, it did not want to talk to the narrator and disappeared in the direction of location 'X'.

Example 2 Non-manual perfective with predicate I

NM	pah				pah
MG	GO-FROM-HERE-TO-X	GHOST	TALK	GO-FROM-HERE-TO-X	
ND					

'The ghost went away, (I tried to) talk, (but it) went.'

Gta60ct7_GO-AWAY#perfectiveaspect.mpg

Another sentence in which the non-manual perfective marker is used with a predicate is shown in Example 3 below. This utterance comes from a narrative by a signer who discusses a financial dispute between his son and daughter-in-law, who live in the same compound. The signer explains that he had already given them three hundred thousand rupiah (RED^THREE). (100,000 Indonesian rupiah bank notes are red and in Kata Kolok are referred to as such.) Importantly, although the translation indicates that the event happened in the past by using past tense, the Kata Kolok sentence only indicates that the event is completed, whether in the future or in the past. It is only through pragmatic implication that the historical interpretation arises. De Vos (2012) addresses the relationship between perfective marker and temporal inference in more detail.

Example 3 Non-manual perfective with predicate II

NM	pah		
MG	GIVE	ME	RED^THREE
ND			

'I had given/gave (them) three hundred thousand rupiah.'

Gta60ct7_GIVE#perfectiveaspect.mpg

As shown above, FINISH#pah is extremely frequent in the Kata Kolok corpus, but how about the non-manual marking of predicates with 'pah'? Facial expression has not been systematically transcribed in the present Kata Kolok corpus. In order to assess the frequency of the bound morpheme 'pah', five one-minute stretches of densely transcribed video data were therefore

sampled from two dialogic conversations and one monologue narrative by five different signers. In these selected stretches of spontaneous discourse, 546 manual signs occurred, including 6 instances of FINISH#pah. The non-manual aspect marker 'pah' occurred 7 times with a predicate. Three instances concerned the sign THROW#pah, two of which followed each other closely in a monologue regarding Indonesia's colonial period, and the third instance was used by a deaf woman whilst gossiping about a quarrel between her neighbours. GO-AWAY#pah occurred four times and was used by two signers, discussing the prices of rice in the different markets of the surrounding villages and the whereabouts of the deaf teenagers. In this stretch of discourse the perfective marker FINISH is thus slightly less frequent than in the overall corpus, but appears equally frequently as the non-manual perfective marker. It is unclear at present what motivates the use of one form over the other, and further analyses are required to determine this. In any case, it would appear that if children acquiring Kata Kolok have a preference for one form over the other, this is not easily explained by an uneven distribution of forms in adult Kata Kolok signing. Recall from the discussion above that child-directed signing may sometimes disfavor the use of non-manual markers because of the associated affective meanings in American Sign Language (Reilly & McIntire 1991). The non-manual marker 'pah' does not have such a negative connotation however and for this reason it is unlikely that the form would have a different distribution in child-directed Kata Kolok.

Finally, the non-manual part of the perfective marker can also be used with predicative pointing signs. Example 4 presents an example of such a combined structure produced by an 8-year-old deaf girl with deaf parents, who is telling a story about a ghost she saw the night before. She discusses how her neighbour, who is said to have supernatural powers, turns into a ghost at night. This ghost went down a path near to the signer's current setting. She uses her non-dominant hand to indicate that path, tracing it along the horizon with her index finger. The pointing sign ends in the use of the non-manual aspectual marker glossed as 'pah' and produced by smacking the lips. While she holds that sign, she produces the sign GHOST with her dominant hand. She then indicates the location where the ghost stopped again by pointing at that location and producing the aspectual marker along with it. The fact that this pointing sign is produced with the aspectual marker indicates that it is treated as a predicate parallel to lexical signs that can be marked in a similar way. The marking of pointing signs by 'pah' and other grammatical non-manuals are taken as evidence for the syntactic integration of pointing signs in Kata Kolok (de Vos 2012).

Example 4 Non-manual perfective marker combined with pointing signs

NM	pah		pah
MG		GHOST	
ND	IX'tracing path'		IX'loc'

'(It) went along that path, the ghost, and then it stopped.'

CGSb14aug7_IX_trace_perfective_aspect.mpg

The sections above have shown that the perfective marker in Kata Kolok occurs both as a fully-fledged form (FINISH#pah), and as a non-manual form ('pah') that attaches to lexical predicates and pointing signs. FINISH#pah is highly salient in the language, as evidenced by its frequency in a corpus of spontaneous Kata Kolok signing and its use in ritual greetings. The occurrence of the non-manual perfective marker alongside predicates had not been systematically transcribed within the corpus but a randomly selected five minutes indicates that this use of 'pah' might be equally frequent as FINISH#pah. In contrast to FINISH#pah, the use of the non-manual perfective marker alongside pointing signs is relatively infrequent: out of 1,183 index finger pointing signs, only a handful of cases has been identified (de Vos 2012). The non-manual form 'pah' does not occur in isolation in adult Kata Kolok signing and for this reason it is best analysed as a bound morpheme.

5. An exploration of the perfective in Kata Kolok child signing

In light of previous work on the acquisition of non-manual morphology, the following questions arise with regard to the acquisition of the perfective marker in Kata Kolok. First of all, by what age does the child acquiring Kata Kolok start to produce both the non-manual and manual perfective markers? Secondly, by what age does the child data start to show the adult distribution of perfective forms? And finally, is there evidence that the manual perfective form takes precedence over the combined non-manual and manual forms in Kata Kolok acquisition, as suggested by Reilly (2006) for American Sign Language?

In order to address these issues, the author analyzed monthly video recordings of a deaf preschooler from 24–36 months of age who is acquiring Kata Kolok natively. As was argued in section 2, the setting in which deaf children acquire sign language in a deaf village is optimally comparable to the acquisition of a spoken language in terms of exposure to the language from birth, numbers of communicative partners and the variety of settings

in which the language is used. These transcription activities identified 1,119 manual signs, of which 458 (41%) were pointing signs. The total data set counts 84 instances of the perfective marker, including the grammatical form FINISH#pah, and the grammatical co-production of 'pah' with pointing signs (IX#pah) and predicates (*PREDICATE*#pah), as well as ill-formed instances of 'pah' and FINISH in isolation.[6] Notably, while the phonological development of these forms could be of interest as well, this paper is mainly concerned with the syntactic distribution and coordination of non-manual and manual perfective forms. There currently are no deaf children within the relevant age range (4–5 years) to test the comprehension of perfective forms by Kata Kolok child signers. The analyses below therefore focus on the spontaneous production of perfective forms in child signing as it differs from the adult use in spontaneous Kata Kolok discourse (see section 4).[7]

5.1. The full form of the perfective marker - FINISH#pah

The sign FINISH was produced 32 times (seven times with two hands). Table 1 presents an overview of the grammatical and ungrammatical instances of this manual perfective marker. FINISH is produced for the first time at 28 months, but without the compulsory non-manual marker 'pah'. The lexical sign FINISH#pah is produced alongside the non-manual marker 'pah' for the first time at 29 months. By 34 months the sign has a considerable frequency (11 times out of 138 manual signs (8%)). The fact that the child still produces ungrammatical forms, lacking the obligatory non-manual marker, at 34 and 35 months, suggests that he may not have fully acquired the perfective marker, however.

Table 1. The use of the manual perfective marker by a Kata Kolok signer between 24–36 months of age.

	Grammatical forms: FINISH#pah	Ungrammatical forms: FINISH	Total instances of the manual perfective marker
24 months	0	0	0
25 months	0	0	0
26 months	No data available		
27 months	0	0	0
28 months	0	1	1

29 months	2	0	2
30 months	2	0	2
31 months	No date available		
32 months	0	0	0
33 months	2	2	4
34 months	10	1	11
35 months	6	4	10
36 months	2	0	2
		total	32

Example 5 below illustrates one of the first instances of the full form of the perfective marker (FINISH#pah). In many of the sessions, there is at least some reference to the camera being used for recording. In the example below, the child signs FINISH#pah, followed by a pointing sign at the camera. Although his utterance would suggest otherwise, this sentence occurred in the middle of the session. While the child uses the form FINISH#pah in a syntactically appropriate slot, he has not fully grasped the aspectual meaning of the perfective marker.

Example 5 FINISH#pah at 29 months

NM	Pah		pah	
MG	FINISH	IX‘camera’	FINISH	IX‘camera’
ND				

‘It (the camera) is finished.’

FINISH#pah_CSB10oct7.mpg

As explained earlier, most deaf children in Bengkala grow up surrounded by many fluent signers, including hearing adults who live in the same compound or nearby. Example 6 (produced at 34 months) was recorded during a casual conversation of Child 1 with one of his hearing neighbours, a semi-fluent Kata Kolok signer. The child had just been given a snack: some rice and meat. The neighbour signed MEAT#rb#nod, thus asking what happened to the meat. The child answered his question by indicating that he had already eaten the meat. This use of the form FINISH#pah is both contextually and syntactically appropriate.

Example 6 FINISH#pah at 34 months

NM		pah
MG	MEAT	FINISH
ND		

'The meat is finished.'

FINISH#pah_CSB9mar8.mpg

As described above, FINISH#pah is an integral part of daily greetings, and as in Example 6, children are frequently prompted to produce this form in response to similar questions. Of all the instances of FINISH#pah and *FINISH in Table 1 there is only one example that goes slightly beyond this ritualised response. Example 7 illustrates how the child initiates a conversation with Ketut Kanta, by declaring that he has eaten and his stomach is full.

Example 7 Creative construction at 35 months

NM			pah
MG	EAT	FULL-STOMACH	FINISH
ND			

'I ate and my belly is full.'

The manual form FINISH has an overall incidence of 2.9% within the child corpus, which is close to the adult use of this form (2.7%). However, all but one of these forms (see Example 5 above) is produced in response to the questions 'Have you eaten?' and 'Have you bathed?' While these forms are culturally salient in Bengkala, they are infrequent in the adult corpus of spontaneous Kata Kolok signing and it would appear that the frequency of these question types in child-directed signing is a factor in this matter. The child-directed utterances within the Kata Kolok corpus should be coded and compared to regular adult signing to determine such an influence.

5.2. The non-manual perfective marker - 'pah'

As was described in section 2, the non-manual part of the perfective marker may also occur along with both lexical predicates and pointing signs, but is ungrammatical on its own. The transcription protocol allowed the non-manual marker 'pah' to be coded independently of the manual form. Table 2 presents an overview of the instances of 'pah' as it is produced simultaneously with pointing signs, lexical predicates, and also its ungrammatical use in isolation. The table reveals that the child starts to produce 'pah' at 25 months, that is, three months before the manual perfective marker occurs. Based on naturalistic observation of two bilingual Indonesian-Italian chil-

dren, Soriente (2007) reports the first instances of *sudah* - the Indonesian perfect particle - by 19 months. In the case of Kata Kolok, 25 months may also not be the actual earliest use of the form by this child, but this study is naturally limited by the recorded data. Tomasello & Stahl (2004) raise the issue of what statistical conclusions we can draw from developmental corpora, and provide an interesting account of how this can be done by taking the incidence of the linguistic structures into consideration. The perfective marker is among the most frequent structures in Kata Kolok, which increases the reliability of the findings reported below.

The coordination of 'pah' with manual forms appears right from the start, but only alongside lexical predicates and pointing signs. In the adult corpus, instances of IX#pah are extremely rare: less than 0.05% of index finger pointing signs are marked by the non-manual perfective marker. Similarly, 14 out of 458 annotated pointing signs are marked in this way, amounting to 0.03% of the pointing signs in the child data. As was described in section 4, the integrated forms of *PREDICATE*#pah are possibly as frequent as FINISH#pah in adult Kata Kolok signing (up to 2.7%). In the child data this combined form is attested in only 17 instances of all 1,119 manual signs (0.02%). The combination of the non-manual marker with predicates and pointing signs suggests that there is nothing inherently difficult about the co-production of manual and non-manual components, and that the coordination of manual and non-manual forms of the same grammatical structures is, as Reilly & Anderson (2002) suggest, a unique challenge in learning a signed language.

Table 2 also reveals that the child produces 'pah' in isolation, without the co-production of any manual forms. The non-adult forms were contextually embedded in each case. Most cases concerned responses to the question 'Have you eaten?' In two cases the child repeated the non-manual aspect marker after it occurred alongside a predicate. From 33 months onwards, the child stops producing the ungrammatical, isolated forms of 'pah', suggesting that he has acquired this specific formal rule concerning perfective aspect in Kata Kolok.

Table 2. The use of the non-manual perfective marker by a Kata Kolok signer between 24–36 months

	Grammatical forms:		Ungrammatical forms: FINISH	Total instances of the manual perfective marker
	IX#pah	*PREDICATE*#pah		
24 months	0	0	0	0
25 months	1	5	6	12

26 months	No data available			
27 months	0	0	0	0
28 months	0	0	0	0
29 months	2	0	1	3
30 months	0	0	0	0
31 months	No data available			
32 months	0	10	9	19
33 months	7	7	0	14
34 months	1	0	0	1
35 months	0	0	0	0
36 months	3	0	0	3
			total	52

Example 8 illustrates one of the first instances of the non-manual perfective marker. Many of the deaf families in Bengkala own livestock such as chickens, pigs, and one or two cows. From a young age, boys in particular are encouraged to contribute to the household by gathering grass for these animals. During the recording session in which this non-manual perfective marker was produced, the child was playing on his parents' farm with an *arit* (a sickle) and *keranjang* (a basket woven from bamboo leaves). In the video, the research assistant and the boy were sitting casually in the ground. Without prompting, the boy explained that the knife he is using is broken.

Example 8 Non-manual perfective marker at 25 months

NM	pah	pah
MG	BREAK	BREAK
ND		

'It (the knife) is broken.'

BREAK#pah_CSB8june7.mpg

Example 9 stems from the same causal conversation described in example 5 above. In this case, the child's hearing interlocutor asks the boy where his older sister is by (incorrectly) producing her sign-name. The boy repeats his sister's sign-name, correcting the sign's orientation. Subsequently, he produces a rapid brow raise, which functions as a question tag in Kata Kolok (Marsaja 2008:202–211). Then, the boy indicates that his sister has already gone away (to a deaf boarding school in Jimbaran, in the South of Bali).

The predicate GO-AWAY is produced simultaneously with the non-manual perfective marker.

Example 9 Non-manual perfective marker at 34 months

NM		rb	pah	pah
MG	SIGN-NAME'D'		GO-AWAY	GO-AWAY
ND				

'What about D.? – She went away, she went away.'

GO-AWAY#pah_CSB9mar8.mpg

5.3. Aspect and telicity

The predicates that attracted the non-manual and manual perfective marker are limited: BREAK, EAT, THROW, GO-AWAY, FALL, and FLASH. This observation thus corroborates the cross-linguistically robust finding that children initially use the perfective marker with telic predicates such as 'break' and 'throw' while the onset of the less frequent combinations of a perfective-atelic and imperfective-telic are delayed. Such combinations are therefore taken as a first indication that the child is starting to deduce the grammatical meaning of these aspectual markers. The first instance spotted in this corpus is presented in Example 10 below. At age 33 months the child uses the non-manual perfective marker with an atelic predicate ('sleep'). As becomes clear from Example 10 however, he combines the non-manual perfective marker with the manual form of the imperfective particle NOT-YET.

*Example 10 *NOT-YET#pah at 33 months*

NM		pah		*pah
MG	SLEEP	IX	SLEEP	NOT-YET
ND				

'I slept there.'

*NOT-YET#pah_CSBb19feb8.mpg

The form NOT-YET#pah in Example 10 represents an intriguing error that results from the simultaneous nature of perfective marking in the language. Given its use with the atelic predicate SLEEP within a sentence it may indicate that the child is on the verge of a developmental stage, starting to grasp the true meaning of FINISH#pah. In support of that interpretation, the child stops producing ungrammatical, isolated forms of 'pah' at the same age (at

33 months, see Table 2). From 33 months onwards, the child also tentatively started to use fewer forms of 'pah' with pointing signs, thus moving toward an adult distribution of these forms.

5.4. Modality-dependent patterns in language development

The fact that perfective aspect is not fully acquired in the age range examined here makes it impossible to truly test Reilly's (2006) generalisation that the coordinated use of non-manual forms is not acquired before the acquisition of their manual counterparts. However, the fact that the non-manual perfective occurs earlier and more frequently in the corpus, despite the fact that both forms appear equally frequently in adult Kata Kolok, does not counter this interpretation. As such, these findings from Kata Kolok motivate the hypothesis that, with language-specific implementations, children acquiring sign languages may follow modality-dependent developmental stages that can be identified across typologically distinct sign languages. In doing so, they may produce modality-specific errors that result from a difficulty in coordinating manual and non-manual components.

This hypothesis adds to Petitto's (1987) observation that, with modality-specific implementations, children acquiring American Sign Language follow the same developmental stages (including similar substitution errors) as do hearing children acquiring English. Specifically, her seminal paper showed that deaf children acquire the syntactic distinction between locative and pronominal pointing signs at 25–27 months, around the same time as hearing children acquiring English and Italian learn to use pronouns. As mentioned in section 2, the use of grammatical non-manual markers with pointing signs is taken as key to understanding the syntactic integration of pointing signs within Kata Kolok (de Vos 2012). Taking Petitto's study as a vantage point, then, it is interesting to highlight that the child data in this study indicate that the non-manual perfective marker appears with pointing signs from the start, that is to say, at 25 months. Further exploration of the child signing corpus has identified additional grammatical markers, such as the use of raised eyebrows to indicate a question, and the use of clenched teeth, a non-manual signal which is currently under investigation. These tentative observations suggest that, with language-specific implementations, the acquisition of pointing signs may also exhibit parallels across sign languages.

6. Cross-linguistic and cross-modal comparisons in acquisition research

The linguistic description of village sign languages has contributed considerably to our understanding of the cross-linguistic variability among sign languages (Zeshan & de Vos, this Volume). Despite its limitations, this paper has aimed to show that recognising this typological diversity is not just a matter of butterfly collecting. By capitalising on these cross-linguistic differences we are able to conduct comparative studies of the acquisition of typologically distinct sign languages for the first time. While temporal aspect is marked in many signed languages, this study presents the first exploration of its development in children. The acquisition of sign language within the context of a deaf village is optimally similar to the situations in which children acquire spoken languages, and comparing the linguistic development of child speakers and signers is thus more likely to reflect genuine differences between the language modalities. Previous research on the acquisition of signed languages has emphasised the stages in language development that are cross-modally robust. The present paper has put forward the hypothesis that there may also be modality-specific developmental steps that occur across sign languages. The simultaneous coordination of non-manual and manual grammatical markers, and more generally, the acquisition of modality-specific structures, inevitably dominates such cross-linguistic investigations. If this approach is extended to include the composite utterances of child speakers, this quest could additionally lead to a deeper understanding of language development from both cross-linguistic and cross-modal perspectives.

Notes

1. I would like to thank Irit Meir (University of Haifa) and Antonia Soriente (University of Naples 'L'orientale' & Max Planck Institute for Evolutionary Anthropology) for their comments on a previous draft of this paper.
2. The simultaneous use of manual and non-manual forms is indicated by the # symbol. Further transcription conventions are addressed in section 4.
3. I would like to thank the deaf and hearing villagers of Bengkala for welcoming me into their community, and especially Ketut Kanta for his assistance during this period.

4. Many of the non-manuals that are listed in these transcription conventions are at present unanalysed. The use of non-manual signals for both linguistic and paralinguistic functions is an under-researched area in the description of Kata Kolok.
5. In fact, one of the foreign researchers who worked in the village is now referred to by his 'unusual' greeting: the use of the sign GOOD with raised eyebrows and a smile as in 'How are you?'
6. Please note that italicised capital letters are used here to indicate that *PREDICATE* is not an actual Kata Kolok sign, but rather represents any lexical predicate within the language.
7. While child-directed signing would have been a better indication of the signed input that this child has received, this aspect of the child-signing sub-corpus had not been transcribed yet.

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