Nasal assimilation and substitution in Standard Indonesian: evidence from production task in loanwords

This paper investigates nasal assimilation and substitution in Standard Indonesian (SI). SI has widely used verbal prefix /məN-/ which alternates in its shape at the prefix-root boundary. This study examines loanword roots borrowed from Arabic, Portuguese, Dutch and English. Using a production task experiment, this investigation finds patterns of variation which are conditioned by both inter- and intra-speaker differences. This study proposes to model the patterns of variation in Noisy Harmonic Grammar (NHG; Coetzee and Kawahara 2013, Coetzee and Pater 2011).

In previous studies of Indonesian (Pater 1999, 2001, Lapoliwa 1981, among others), a nasal in the coda position of the prefix /məN-/ alternates when it patterns with root-initial consonants. In native Malay/Indonesian roots, nasal assimilation occurs when prefix /məN-/ is combined with roots that begin with voiced stops, as in /məN+bəli/ [məmbəli] 'to buy'. The underlying nasal assimilates to the root-initial voiced stops forming homorganic clusters. Nasal assimilation is also applied to [d]- and [g]- initial stops. Nasal substitution occurs when prefix /məN-/ is combined with roots that begin with voiceless stops, as in /məN+pilih/ *məmilih* 'to choose'. Following serial rule ordering approach, Ikranagara (1980) proposed that the underlying nasal assimilates to the root-initial voiceless consonants which then forms homorganic cluster. This process is then followed by deletion of the initial consonant. In the more recent studies, Pater (2001) and Zuraw (2010) termed these two phonological processes as nasal substitution. Nasal substitution is also applied to [t]- and [k]- initial stops.

Less attention, however, has been given to the patterns of nasal assimilation and substitution to loanword roots which behaves differently from the native roots. Sneddon (1996) noted that in loanwords, root-initial voiceless stops may undergo nasal assimilation or substitution as in /məN+protɛs/ [məmprotɛs ~ məmrotɛs] (English) 'to protest', /məN+taat+i/ [məntaʔati ~ mənaʔati] (Arabic) 'to obey', /məN+kritik/ [məŋkritik ~ məŋritik] (English) 'to criticize'.

This current production task uses 30 loanwords that begin with [p-, t-, k-] (labial, alveolar and velar respectively). If these loanwords are prefixed with /məN-/, the initial stops are predicted to surface as either assimilated or substituted forms. Each word is embedded in two different sentences. Thus, there are a total of 60 test sentences recorded by a male speaker. Participants listened to the test sentence in passive form and afterward produced active sentence item by item. There were 8 participants involved in this investigation. Figure 1 presents nasal substitution distribution by speakers which are pooled across place of articulation. This preliminary results found that there were three type of of speakers. Speaker type A (S1, S4 and S5) produced more than 80% substitution, speaker type B (S3 and S8) produced around 50% substitution, while speaker type C (S2, S6, and S7) produced around 30% substitution. This pattern of inter-speaker variation show us that speaker type A and C are non-variable speakers. Speaker type A more consistently produced substitution, while speaker type C were more resistant to substitution. Instead, they produced more assimilation. Among the three types, speaker type B shows the highest degree of variability.

All speakers also produced intra-speaker variation that occurs within place of articulation and across lexical items. For example, S1 produced [məmplɛstər] 'to plaster' in the first test sentence and [məmlɛstər] 'to plaster' in the second test sentence. He also produced [məŋkapliŋ] and [məŋapliŋ] 'to divide land/lot'.

In current formal account (Pater 1999, 2001 and Zuraw 2010 among others), nasal assimilation and substitution are commonly analyzed within Optimality Theoretic approach (OT; Prince and Smolensky 1993, 2004). For root-initial voiceless stops in Indonesian native roots, Pater (2001) used CRISP-EDGE[PRWD][1] to block nasal assimilation, and violates UNIFORM to allow nasal substitution. The variation in this study, where two different surface actually occur in the output, can not be modeled in traditional OT. Therefore, I propose to use Noisy Harmonic Grammar to model such variation. NHG works with weighted and gradient constraints rather than categorically ranked constraints. Noisy evaluation in NHG provides a room for constraints to accomodate relative ranking between two competing constraints. Thus, this study makes a twofold contribution. First, it shows systematic patterns of inter- and intra-speaker variation in nasal assimilation and substitution in SI. Second, it applies NHG to model such variation.

[1] See Cohn and McCharty 1994/1998 for more discussion on CRISP-EDGE[PRWD] idea in Indonesian.

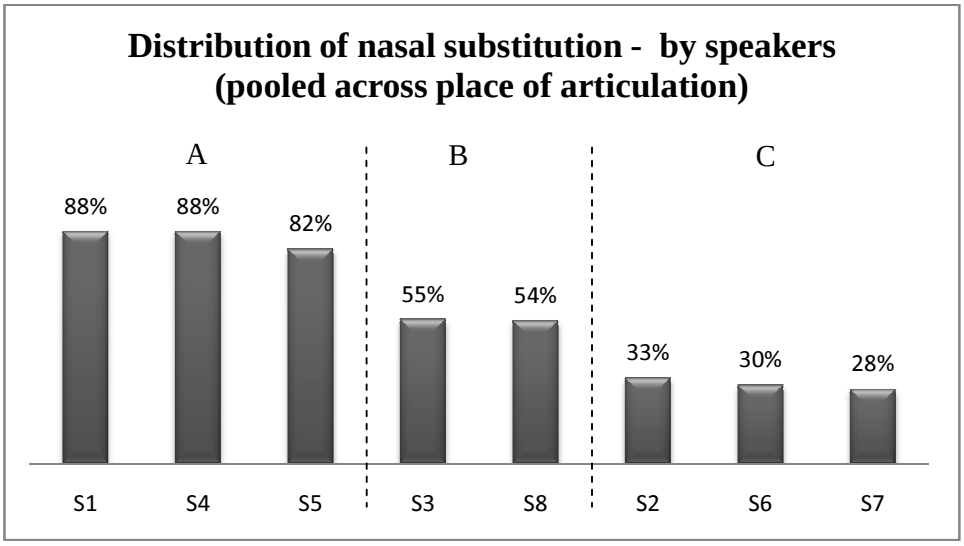

Figure 1

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