Prosody conveys discourse-level information [1][2], but the extent to which prosodic cues distinguish different kinds of information remains unclear ([2][3] on new-information/contrastive focus). The prosodic encoding of discourse-information is even more complicated in tone languages, where cues such as duration, intensity and F0 also distinguish lexical items (e.g. Mandarin Chinese [4][5]). Prior work in Mandarin led to divergent findings regarding (i) presence/absence of differences between focus-types (new vs. corrective/contrastive) and (ii) what cues—if any—mark differences between focus-types (lengthening, F0 range expansion, intensity), e.g.[6][7].

We conducted a production study on Mandarin to investigate whether (i) the presence/absence of correction and (ii) the new/given distinction are encoded prosodically (2x2, 36 targets, 36 fillers). Participants (4 women, 4 men) produced instructions to move an object to a location, indicated by pictures and arrows (Fig.1), e.g. ‘*Move the bamboo*TARGET next to the fridge*’ (Ex.1). Target nouns were bisyllabic, with High-High, High-Low, Low-High tonal contours (HH/HL/LH).

Fig. 1: Sample display of stimuli

(1) ba  OBJECT fangdao  LOCATION pangbian
(particle) OBJECT put  LOCATION side
‘Move the OBJECT next to the LOCATION’

In Non-corrective conditions, the correct object (e.g. bamboo) moved after the command. In Corrective conditions, an incorrect object moved after the participant first produced the command (e.g. the sunglasses moved next to the fridge)—so participants had to repeat the command to correct the incorrect movement. In New conditions, the target word had not been mentioned on that trial until the participant first used it. In Given conditions, the target word occurred in a correct movement earlier on the same trial (i.e., known to hearer). There were four conditions: Corr|New, Corr|Given, NoCorr|New, NoCorr|Given.

Results-The presence/absence of correction was reflected in all three acoustic parameters: Target words in Corrective conditions had longer durations, and larger F0- and intensity-ranges than Non-corrective words (p’s<.03).

The new/given distinction was reflected in duration and F0, but only in Non-Corrective conditions (significant Correction-by-Givenness interaction). Corrective conditions had no differences between given/new. In Non-corrective conditions, New information had longer duration, larger F0-ranges than Given information (p’s<.04); intensity-ranges did not differ. This suggests new-information focus is encoded differently from correction: Only correction is associated with expanded intensity-ranges.
The absence of given/new effects in Corrective conditions may be due to acoustic marking of
givenness/newness being defined from the speaker’s perspective: In all Corrective conditions, the
target words had already been uttered by the speaker, although the hearer apparently had not heard
them properly the first time.

Fig. 2-4: Duration, F0 ranges, intensity ranges in the four information types
(X-axis: tone types of the target words)

Discussion—Even in a language with lexical tones, which differ in F0, duration, and intensity, all of
these acoustic dimensions also encode information-structure. We found no evidence for a
‘specialized-function’ situation where some cues mark information-structure and others mark lexical
distinctions. Instead, all three dimensions are multi-functional. However, further analyses showed that
intensity-range expansion was due to minimum-intensity lowering, while F0-range expansion resulted
from maximum-F0 raising, pointing to pressures/constraints on how information-structure is encoded.
Combining our work with prior claims, it seems that variations in the ranges of both F0 and intensity
can mark information-structure, whereas their shapes/contours carry information about lexical tones
[4][5]. This highlights the fine-grained ability of the language production system to utilize different
aspects of acoustic dimensions.

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