Polar questions via contraries in Chinese Sign Language

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Background Polar questions (e.g. *Are you hungry?)* differ from constituent questions (*Who is eating?)* and alternative questions (e.g. *Do you prefer RICE or PASTA?*) in their possible answers, which must be either a positive ((*yes,) I am hungry*!) or negative ((*no,) I am not hungry*!) polarity focused proposition. Polar questions in sign languages often involve dedicated nonmanual marking and/or dedicated question particles. Here we focus on a form of polar questions in Chinese Sign Language (CSL) that involves the use of contraries. Tang 2006 discusses the use of A-not-A polar questions in Hong Kong Sign Language (HKSL), which shares a high proportion of its vocabulary with Chinese Sign Language as used in Shanghai (Woodward 1993), the same CSL dialect that we focus on here. Tang notes that sentence-final question particles in HKSL can be formed out of a positive and negative, e.g. GOOD+BAD and HAVE+NOT-HAVE. Since these typically appear sentence-finally and seem to be phonologically reduced, she analyzes GOOD+BAD as a semantically and syntactically simplex polar question marker, with one exception of a potentially non-simplex case involving HAVE+NOT-HAVE in a non-sentence final position, which was analyzed as a calque from spoken Cantonese.

Data Pattern This work begins by first noting that, in contrast with HKSL, a similar construction is quite productive in CSL in Shanghai. (1a) shows an example with a positive and negative modal, but other varieties include GOOD^BAD (1b), YES^NO (1c), LIKE^DISLIKE (1d), and NEED^NONEED (1e). In fact, this form of polar questions seems to be productive for *any pair in which there are morphologically simplex contrary/antonym* signs in the language.

SCHOOL   GO   CAN   CANNOT

(1)   'Can (you) go to school?'   (CSL)

(1a) SCHOOL GO CAN^CANNOT   (1d) YOU GO SCHOOL LIKE^DISLIKE

(1b) YOU GO SCHOOL GOOD^BAD   (1e) YOU GO SCHOOL NEED^NONEED

(1c) YOU GO SCHOOL YES^NO

What is most notable about this generalization is that it is highly productive, similar to the well known A-not-A construction in spoken Mandarin, yet built in an opposite way to the Mandarin case. Mandarin A-not-A polar questions are necessarily built from two *contradictories*, a positive and its negation (2), e.g. *good* and *not good* (contrast with *good* and *bad* in the CSL case in (1)).

2a. 你去不去学校? Ni qu bu qu xuexiao/ You go-not-go school   2b. 你能不能去学校? Ni neng-bu-neng qu xuexiao/You can-not-can go school   2c. 你去学校，好不好? Ni qu xuexiao hao-bu-hao/ You go school good-not-good   2d. 你喜欢不喜欢去学校? Ni xihuan-bu-xihuan go school/You like-not-like go school

Analysis From a formal semantic perspective, the disjunction of two contradictories is logically equivalent to a polar question, namely, both are simply the set of alternatives containing a proposition and its negation (e.g. {p, ~p}), and so Mandarin style A-not-A may be analyzed as underlyingly structurally involving disjunction (Huang 1991), yet result in the logical equivalent of a polar question. However, this cannot be the case for contraries: a disjunction (e.g. *Was it good or bad?)* combines two alternatives {p,q}, which in the case of contraries do not overlap, but unlike contradictories do not partition the entire possibility space. Intriguingly, CSL does not only permit contraries, it strongly disprefers contradictories in polar questions (3). Similarly intriguingly and entirely opposite from CSL, Mandarin actually rules out polar question formation via contraries, which are totally ungrammatical in spoken Mandarin (4). (3a) YOU SCHOOL GO-NOT-GO (considered Mandarin-like, not CSL) (3b) YOU GO-NOT-GO SCHOOL (highly unacceptable)   (4a) *ni qu xuexiao hao huai?* you go school good bad (highly unacceptable)   (4b) *ni qu xue xiao xihuan taoyan?* you go school like loathe (highly unacceptable)

So, are the questions we see in CSL in (1) even polar questions (vs. disjunction of contraries)? One clear piece of evidence that they are is that they can be answered in the affirmative (e.g. with just YES, or head nodding) or in the negative (e.g. with just NO or head shaking). These are thus true polar questions formed out of contraries. Following Tang 2006, we agree that these seem to be polar question markers, yet unlike HKSL they are quite productive and derived from pieces that contribute further propositional content, e.g. the questions in (1) are not all equivalent to each other. We propose that the C^0 head that introduces a propositional variable for both polar and wh-questions (see Dayal 2016) is sentence-final in CSL and many other sign languages, and that in CSL, C^0 can be filled by an abstract polar question marker that seeks polarity features originating lower in the clause on a predicate (e.g. LIKE, GOOD), modal (e.g. CAN), or propositional anaphora (e.g. YES). The C^0 head is then spelled out as this bisyllabic particle involving the head carrying the polarity feature along with its contrary, sentence-finally. Although likely influenced by spoken language contact, our proposal for CSL is necessarily different from analyses of Mandarin, involving no underlying disjunction given the opposite requirements (contradictories vs. contraries) and its dedicated syntactic position. We emphasize that the formation of polar questions via contraries shares features familiar from sign linguistics, notably the use of dedicated non-manuals (which are obligatory, though not our focus here) and morphological incorporation of negation into contentful signs. It also shares the juxtaposed neg/pos structure with spoken Mandarin. However, it is unique among these in the use of contraries to express polar questions, contributing to our cross-linguistic understanding of polar questions in sign languages and analysis of negation and questions in language more broadly.