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Time is Money: Some Syntactic Arguments from Hong Kong Cantonese

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Abstract

This paper investigates the monetary and temporal expressions in Hong Kong Cantonese. For the monetary expressions, we focus on the word *man* 'dollar', *hou* 'ten cents', and *go* which we consider as a numerical base. We conclude that all monetary expressions, given their value-denoting nature, modify the silent noun VALUE. In the expression of clock time, the temporal unit *dim* 'point' is analogous to the monetary *go* in the sense that both function as a numerical base. Clock time expressions in Cantonese are more complicated in that they represent the relation between hours, the twelve clock segments, and minutes. All clock time expressions modify the silent noun TIME.

Keywords

numerical base, monetary unit, temporal unit, silent noun

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1. Introduction

The paper investigates the expression of monetary and clock time units in Hong Kong Cantonese (HKC). For the monetary expressions, we focus on the word *man* 'dollar', *hou* 'ten cents', and *go*, which we consider numerical bases used for monetary expressions (cf. Hurford 1987, 2007). We argue, along the recent theory of phonologically silent expressions in Kayne (2006, 2010), that the monetary units can modify various types of nouns including silent nouns. For temporal expressions, in addition to the usual clock time unit *si* 'hour' and *fan* 'minute', we argue that *dim* as a clock time unit functions analogously with the monetary *go* as a numerical base for temporal expressions. Overall, both monetary and temporal expressions can modify overt or silent nouns depending on contexts. The paper is structured as follows: Section 1.1 discusses the basic monetary unit *man* 'dollar'. Section 1.2 talks about the smaller monetary unit *hou* 'ten cents'. Section 1.3 discusses the monetary unit *go* as a numerical base. Section 1.4 and 1.5 compare the grammatical properties of *go* with the decimal marker *dim* and *man*, respectively. Section 2 discusses the temporal unit *dim*. Section 3 concludes the whole paper.

1.1. *Man* 'dollar'

The use of *man* 'dollar' is commonly considered as the basic monetary unit in HKC, e.g.:

(1) jat baak man (one hundred dollar '$100')

The use of *man* in HKC is as straightforward as English 'dollar'.[1] Almost any numeral can be followed by *man* in the expression of currency.

(2) a. sap man (ten dollar '$10')
b. ji-sap saam man (twenty three dollar '$23')
c. jat baak saam-sap ng man (one hundred thirty five dollar '$135')

As the number grows, the acceptability of the use of *man* will decline. In some cases, the currency unit is preferred to be left empty:

(3) a. Cang lau maai sei baak maan (??man).
Cl_{floor} house sell four hundred ten.thousand dollar
'The house sells for four million dollars.'
b. Go gaan gungsi gau nin zaan-zo jat jik (*man).
that Cl company last year earn-asp one hundred.million dollar
'The company has earned one hundred million dollars last year.'

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[1] There exists a more formal word *jyun* which is also translated as 'dollar'. This word is cognate with the Standard Chinese word *yuan* which is widely used in Mandarin Chinese. *Jyun* is rarely or never used in colloquial Cantonese, except in the expression of formal financial terms, e.g. *gong jyun* 'Hong Kong dollar'.

It is widely observed that the combination of a simple/complex numeral and *man* (henceforth ‘Num-*man*’ for short) can further describe another noun, which strongly suggests that value-denoting expressions such as *sap man* ‘ten dollars’ are a modifier of a silent noun. In some cases, value-denoting expressions can modify an overt yet semantically vacuous noun. For instance, the Num-*man* sequence can modify the noun *gai* (which literally means ‘chicken’, yet is widely used in currency expressions). Example (4) is potentially ambiguous. It can denote ten dollars (in value), a ten-dollar note, or a ten-dollar coin.

(4) sap man gai (ten dollar chicken ‘a ten-dollar note/coin’)

There seems to be a conceptual (i.e. encyclopedic) relation between the Num-*man* sequence and *gai*. The general intuition is that *gai* is felicitous if the corresponding numeral is a small amount. Consider the contrast in (5):

(5) <ng/sap/??ng-sap/*jat baak> man gai
five/ten/fifty/one hundred dollar chicken

The final interpretation of *gai* is subject to other grammatical conditions. In (6), the expression *sap man gai* refers to a ten-dollar coin, given the generic classifier *go* which selects a physical object. As a result, (6) cannot refer to two five-dollar coins even though they have the same value (i.e. ten dollars):[2]

(6) Go dou jau go sap man gai.
that place have Cl ten dollar chicken
‘There is a ten-dollar coin.’ (cannot mean: two five-dollar coins[3])

On the other hand, as shown in (7), *jaa man gai* refers to a twenty-dollar note given the classifier *zoeng* which semantically requires a flat object (e.g. paper).

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2 In fact, it is possible that native speakers find the meaning of *gai* vacuous. In many cases, the use of *gai* does not necessarily refer to physical objects. For instance, the expression *sap man gai* does not refer to a ten-dollar note/coin, but the general value of ten dollars (indicated by the predicate *maai* ‘sell’):

(i) Li bun syu maai sap man (gai).
this Cl book sell ten dollar chicken
‘This book sells for ten dollars.’

3 One reviewer correctly points out that *sap man gai* in (6) does not refer to two five-dollar coins because of the classifier *go* which selects a single physical object. He/she suggests that in particular contexts, *sap man gai* ‘ten dollars’ in (i) is compatible with a reading in which there is a number of coins totaling ten dollars (e.g. two five-dollar coins, five two-dollar coins, or ten one-dollar coins, etc):

(i) Lei dou zunggung jau sap man gai.
this place total have ten dollar chicken
‘Here, there are totally ten dollars.’

As we mentioned in footnote 2, the meaning of *gai* can be vacuous, and therefore one potential reading of (i) is value-denoting, i.e. there are ten dollars. Such a reading does not restrict the types of coins/notes used to express the amount.

The use of *go*, a neutral sortal classifier which is incompatible with flat objects, is infelicitous given that in Hong Kong, twenty dollars are a banknote (not a coin): [4]

(7) Go dou jau <zoeng/*go> jaa man gai.
that place have Cl twenty dollar chicken
'There is a twenty-dollar note.' (cannot mean: there are two ten-dollar notes)

The Num-*man* sequence can moreover modify other nominal expressions. Again, one needs to resort to encyclopedic knowledge of Hong Kong notes and coins in order to judge whether the combination is acceptable:[5]

(8) a. sap man ngan (ten dollar silver 'a ten-dollar coin')
b. #jaa man ngan (twenty dollar silver 'a twenty-dollar coin')

(9) a. sap man zi (ten dollar paper 'a ten-dollar note')
b. jaa man zi (twenty dollar paper 'a twenty-dollar note')
c. #ng man zi (five dollar paper 'a five-dollar note')

Unsurprisingly, the Num-*man* sequence can form partitive constructions, similar to English 'ten dollars of beef':

(10) a. sap man saanzi (ten dollar change 'ten dollars in change')
b. sap man ngaujuk (ten dollar beef 'ten dollars of beef')

In Cantonese, one reliable diagnostic for partitives is the use of linker *ge*. Example (11a, b) can further form a partitive structure with *ge*. On the other hand, partitives are not compatible with typical modification such as *sap man ngan* 'ten-dollar coin'. Observe the following contrast:

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[4] For the original discussion of the relation between classifiers and nouns, please refer to Chao (1968), Li and Thompson (1981), and Cheng and Sybesma (1999), among many others.

[5] One reviewer comments that the pattern in (8) and (9) is linguistically insignificant since the unacceptability of (9b) and (10c) is not a linguistic issue, but stems from the speaker's world knowledge. On the other hand, native speakers of Cantonese who are ignorant of Hong Kong system of coins and notes should judge (8b) and (10c) as grammatical. This comment, while commonly agreed by syntacticians in the traditional sense, should be treated with more caution after Kayne's (2006, 2010) recent theory of syntactic representation of lexical items. Kayne's decompositional approach made a strong claim about how modification (e.g. 'red' in 'red car', 'many' in 'many books', etc) is syntactically expressed. Accordingly, a modifier (e.g. an attributive adjective) does not always combine with the head noun in syntax, but instead with another noun which is unpronounced (indicated by the capitalized words). For instance:

(i) red COLOR car
(ii) many NUMBER books

Along this line of thought, the claim that 'red' modifies COLOR stems from the assumption that color as a semantic feature of 'car' is syntactically represented. Accordingly, salient semantic/conceptual features should be syntactically represented. Extending this approach to the current paper, one can argue that the semantic features of COIN and NOTE can be syntactically distinguished.

(11) a. sap man ge <saanzi/ngaujuk>
ten dollar GE change/beef
'ten dollars in change/of beef'

b. *sap man ge <ngan/zi>
ten dollar GE coin/note
*'ten dollars of coins/note'

Based on these aforementioned examples, we can assume that in all cases, the Num-*man* sequence modifies a silent noun, which we tentatively call VALUE.[6] Any Num-*man* sequence, regardless of its final interpretation in the sentence (e.g. a value, a coin, or a note), stems from its primitive interpretation as a value-denoting expression. In addition, we assume that the concept of *man* 'dollar' needs to match with that of silent VALUE, which we term as $\text{VALUE}_{\$}$:

(12) *sap man* $\text{VALUE}_{\$}$

As we observed before, the Num-*man* sequence can modify other types of silent/overt nouns depending on the intended meaning. *Sap man* 'ten dollars' can refer to a value, a ten-dollar coin, or a ten-dollar note, given sufficient contexts. The word

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6 One reviewer questions if the use of empty noun VALUE is felicitous here. His/her reason is that value expresses the dimension of measurement which is usually not a good candidate for the silent noun. Instead the reviewer proposes that the silent noun MONEY should be used here. First, we think there is no conflict between silent nouns as a syntactic category (i.e. a nominal category) and value as an expression of dimension of measure. It is clear that the word 'value' is a noun regardless of its meaning. In Chinese, we roughly translate 'value' as *zik*. But variants such as *souzik* (for the expression of numerals) and *gaazik* (for the expression of value/price) can be used depending on the contexts:

(i) the value of the pi (English)
(ii) paai ge zik/souzik
Pi GE value
'the value of Pi'
(iii) cang lau ge gaazik
Cl house GE value
'the value of the house'

On the other hand, in Cantonese, MONEY is translated as *cin* or *gamcin*. While both are nouns, their semantic denotations are mostly referential. The distinction between VALUE and MONEY is evidently shown in (iv) and (v). In (iv), *sap man* 'ten dollars' clearly expresses a value-denoting reading (i.e. not a referential reading):

(iv) Li bun syu zik sap man.
this Cl book cost ten dollar
'This book costs ten dollars.'

Moreover, in (v), monetary expressions modify the silent noun VALUE (or probably PRICE), not MONEY:

(v) Li bun syu ge <gaacin/saugaa/gaazik/*cin/*gamcin> hai jat baak man.
this Cl book GE price/selling price/value/money/money be one hundred dollar
'The price/value/*money of this book is one hundred dollars.'

ngan ‘coin’ and *zi* ‘note’ is not always required if the context is salient (e.g. by the particular choice of a classifier):[7]

(13) Go dou jau go sap man VALUE$_{\$}$ COIN.
that place have Cl ten dollar
‘There is a ten-dollar coin.’

(14) Go dou jau zoeng sap man VALUE$_{\$}$ NOTE.
that place have Cl ten dollar
‘There is a ten-dollar note.’

Certainly the use of an overt head noun (i.e. *ngan* ‘coin’ in (15), *zi* ‘note’ in (16)) equally grammatical:

(15) Go dou jau go sap man VALUE$_{\$}$ ngan.
that place have Cl ten dollar coin
‘There is a ten-dollar coin.’

(16) Go dou jau zoeng sap man VALUE$_{\$}$ zi.
that place have Cl ten dollar note
‘There is a ten-dollar note.’

In some cases (though relatively rare), the overt noun *gaacin/gaazik* ‘value/price’ can be used, showing that VALUE can be phonologically realized:

(17) Sap man gaacin, ji-sap man zatsou.
ten dollar price twenty dollar quality
‘Ten dollars in price, twenty dollars in quality.’ (used in advertisement)

An indirect way to demonstrate that the Num-*man* sequence modifies VALUE instead of other nouns is that it can be an argument of value-denoting predicates such as *maai* ‘sell’, *zik* ‘worth’ (e.g. (18)), or *zaang* ‘owe’ (e.g. (19)):

(18) Li bun syu <maai/zik> sap man VALUE$_{\$}$.
this Cl book sell/worth ten dollar
‘This book sells for/worth ten dollars.’

(19) Ngo zaang keoi sap man VALUE$_{\$}$.
I owe he ten dollar
‘I owe him ten dollars.’

To summarize:

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7 We adopt Kayne’s (2006) notation in which a silent noun is capitalized.

(20) a. In Hong Kong Cantonese, the basic monetary unit *man* ‘dollar’ combines with a numeral and modifies the silent noun $\text{VALUE}_{\$}$ by default, i.e. [Num-*man*] $\text{VALUE}_{\$}$.
b. The Num-*man* VALUE sequence can furthermore modify other silent/overt nouns.

1.2. *Hou* ‘ten cents’

Similar to *man*, HKC uses *hou* ‘ten cents’ as a smaller monetary unit. *Hou* is preferred in more formal contexts:

(21) saam man ji hou (three dollar two ten-cent ‘$3.20’) (used in more formal contexts)

The use of numerals for *hou* is more restricted than that for *man*, i.e. only single-digit numerals ranging from *jat* ‘one’ to *gau* ‘nine’ can be used. Numerals such as *ling* ‘zero’ or double-digits such as *sap* ‘ten’ or *baak* ‘hundred’ are banned. This is obvious given that the numeral *ling* ‘zero’ does not have any semantic contribution to the monetary expression, whereas double-digits such as *sap* ‘ten’ gives rise to the expression *sap hou* ‘ten ten-cent’ which can be expressed by a higher monetary unit *jat man* ‘one dollar’.[8] Moreover, similar to the use of *man*, the Num-*hou* sequence can modify different types of nouns:

(22) a. ng hou zi (five ten.cent son ‘fifty-cent coin’)
b. ng hou saanzi (five ten.cent change ‘fifty cents in change’)

Based on our claim (20), the Num-*hou* sequence can also modify various types of silent/overt nouns, including the silent noun VALUE by default, i.e. $\text{VALUE}_{¢}$. (23a) means ‘fifty cents’ in value, whereas (23b, c) mean the fifty-cent coin and fifty-cents in change, respectively:

(23) a. *ng hou* $\text{VALUE}_{¢}$
b. *ng hou* $\text{VALUE}_{¢}$ zi
c. *ng hou* $\text{VALUE}_{¢}$ saanzi

Assuming that complex monetary expressions in Chinese can be decomposed to simple additive and multiplicative rules (i.e. [*jat baak*] [*ji sap*] = [one × hundred] + [two × ten] ‘120’), we suggest that if the monetary expression consists of *man* and *hou*, the two monetary expressions are combined by a simple additive marker AND, i.e.:[9]

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[8] Given that *ling* ‘zero’, *sap* ‘ten’ and *baak* ‘hundred’ are morphologically simple words, it suggests that the ban on *sap hou* ‘ten ten-cents’ must be conceptual, not linguistic.

[9] The distinction between $\text{VALUE}_{\$}$ and $\text{VALUE}_{¢}$ has no formal status in grammar. It is merely a marking device for different monetary units. The same applies to various numerical bases (e.g. tens, hundreds, thousands, etc). For instance Hurford (1987, 2007) terms all numerical bases M (multiplicative base morphemes).

(24) Num-*man* VALUE$_{\$}$ AND Num-*hou* VALUE$_{¢}$

Interestingly, the additive marker AND (which is silent by default) can be overtly expressed, e.g. *ling* ‘zero’, and marginally, *jau* ‘also’ (in formal or archaic contexts):

(25) saam man <ling/jau> ng hou
three dollar zero/also five ten.cent ‘$3.5’

To summarize so far:

(26) a. In Hong Kong Cantonese, the monetary unit *hou* ‘ten cents’ combines with a numeral and modifies the silent noun VALUE$_{¢}$, i.e. Num-*hou* VALUE$_{¢}$.

b. Monetary expressions which contain ‘dollar’ and ‘ten cents’ assume a complex numerical structure, i.e. Num-*man* VALUE$_{\$}$ AND Num-*hou* VALUE$_{¢}$.

1.3. The properties of *go* in monetary expressions

Perhaps the most distinctive monetary expression in HKC (which is not attested in Mandarin Chinese) is the use of *go*. In most cases, *go* functions as a neutral sortal classifier, similar to Mandarin Chinese *ge* (Matthews and Yip 2011). Au Yeung (2005, 2007, 2012) argues that in numerical expressions, Mandarin *ge* and Cantonese *go* behave similarly with other numerical bases such as *sap* ‘ten’, *baak* ‘hundred’, *cin* ‘thousand’ and *maan* ‘ten thousand’. The Chinese numerical base is transparent in that it always follows a numeral. By means of simple multiplication and addition, the actual numeral can be easily generated. Let us start from one typical example:

(27) saam baak ng sap sei
three HUNDRED five TEN four ‘354 (i.e. 3×100+5×10+4)’

The complex numeral ‘three hundred fifty-four’ is formed by concatenations of three numerical expressions, i.e. ‘three hundreds’, ‘five tens’ and ‘four’ (Au Yeung 2005 et seq.). It is generally assumed that each component contains a numerical base, i.e. *baak* ‘hundred’ (as in *saam baak*) and *sap* ‘ten’ (as in *ng sap*). The only exception in (27) is the single-digit *sei* ‘four’ which is not followed by any overt numerical base. Au Yeung suggests that *go* semantically refers to the numerical base ‘one’ which is phonologically silent. His argument of *go* as a numerical base stems from the fact that the expression *go sap baak cin maan* ‘one, ten, hundred, thousand, ten thousands’ is used in recited counting. Along this line, (27) is equivalent to (23) with a silent numerical base *GO*:[10]

10 The particular constituent grouping in (28) can also be phonologically described. For instance, all the constituents are trochees in the sense the primary stress is placed on the first syllable. This may potentially account for the silent *GO* (as an unstressed syllable) as proposed by Au Yeung. Also there can be phonological change within a single phonological constituent, e.g.:

(28) [*saam baak*] [*ng sap*] [*sei GO*]

The claim that the numerical base *GO* is phonologically silent is cross-linguistically attested. While it is not surprising to find languages in which the numeral 'ten' and its higher powers (e.g. hundred, thousand, etc) function as a numerical base, those languages may not allow the numeral 'one' as a potential numerical base. In English, the suffix '–ty', 'hundred', 'thousand', etc, function as the numerical bases:[11]

(29) a. twen-ty, thir-ty, for-ty
b. two hundred, three hundred, four hundred
c. two thousand, three thousand, four thousand
d. two million, three million, four million

Kayne (2006) points out that numerical base can form a partitive structure:

(30) There were <?tens/hundreds/thousands/millions> of mistakes in your paper.

Notice that 'one' is excluded in partitive structures:

(31) *There were ones of mistakes in your paper.

Other languages allow more numerals to form a numerical base in addition to 'ten'. For instance in French, numerals such as *dix* 'ten', *douze* 'twelve', *quinze* 'fifteen', *trente* 'thirty', etc, can be derived into a partitive numeral, e.g. (Kayne 2010: 60):

(32) Il y avait une <quinzaine/vingtaine> d'erreurs dans votre papier.
lit. 'There were fifteens/twenties of errors in your paper.'

The use of *un* 'one', on the other hand, is strictly banned as a partitive numeral in French, and the imaginary word *unaine/uneaine* 'ones' is predictably impossible.

Returning to HKC, it appears that *sap* 'ten' is considered as the lowest numerical base (i.e. ten to the power of zero). Other higher powers of 'ten' can also form a numerical base. On the other hand, the numeral *jat* 'one' is not considered as a numerical base:

(33) Gaan tousyugun jau gei <*jat /sap /baak /cin> bun syu.
Cl library have several ONE/TEN/HUNDRED/THOUSAND Cl book
'The library has <*ones/tens/hundreds/thousands> of books.'

It also bans the use of classifier *go* which Au Yeung considers as the numerical base:

(i) *ji sap* → *jaa* '20'
(ii) *saam sap* → *saa aa* '30'

11 See also Hurford (1987, 2007) and Kayne (2006) for a similar claim.

(34) *Gaan tousyugun jau gei go bun syu.
Cl library have several GO Cl book
*'The library has ones of books.'

The above observation leads Au Yeung to conclude that HKC *go* as a numerical base is silent. Indeed, we argue that the use of *go* as a numerical base is fully instantiated in monetary expressions. Let us start from some basic examples:

(35) a. saam go ji (three *GO* two '$3.2')
b. sei go baat (four *GO* eight '$4.8')

The first impression about the use of *go* in (35) is that it expresses the meaning of 'dollar', and moreover it is always found between two numerals. We notice that the use of *go* in monetary expressions (henceforth 'the monetary *go*') is restricted by the following conditions:

(36) a. The monetary *go* can be preceded by an overt numeral.
b. The monetary *go* must be followed by an overt numeral.
c. The preceding numeral can be one of the following: *jat* 'one', *ji* and *loeng* 'two',[12] *saam* 'three', *sei* 'four', *ng* 'five', *luk* 'six', *cat* 'seven', *baat* 'eight', *gau* 'nine', *sap* 'ten'.
d. The following numeral can be any of the following: *ling* 'zero', *jat* 'one', *ji* 'two', *saam* 'three', *sei* 'four', *luk* 'six', *cat* 'seven', *baat* 'eight', *gau* 'nine', *bun* 'half', *leng* 'a few'.

Let us discuss these cases one by one. The statement of condition (36a) means that while *go* can be preceded by any overt numeral, this is not always the case. A preceding numeral can be silent. This is the case of the bare numeral *jat* 'one'. While the following two expressions are synonymous, native speakers strongly prefer (37b) to (37a) ((37a) is more acceptable in formal situations):

(37) a. ??jat go saam (one *GO* three '$1.3')
b. go saam (*GO* three '$1.3')

The omission of *jat* 'one' is subject to further conditions. Only the bare numeral *jat* can be omitted. Consider the following examples in (38). The numeral *jat* in (38a) is not omissible since it is not bare, and moreover (38a) and (38b) are not synonymous:

(38) a. saam-sap jat go saam (thirty one *GO* three '$31.3')
b. saam-sap go saam (thirty *GO* three '$30.3')

In this regard, the omission of *jat* before the monetary *go* is analogous to other numerical bases, which lead us to confirm Au Yeung's claim that *go* is a numerical base. All examples in (39) show that *jat* is also omissible before other numerical bases (e.g. *baak* 'hundred', *cin* 'thousand') followed by another bare numeral.

[12] See Matthews and Yip (2011: 450-451) for the distinction between *ji* and *loeng*.

Examples in (40) show that the numeral after the numerical base must be bare. Example (41) shows that if *jat* is overt, the numeral which follows the numerical base can be complex (i.e. not bare). Example (42) shows that if *jat* is overt, the numeral after the numerical base should be complex:

(39) a. go sei (*GO* four '$1.4')
b. baak sei (HUNDRED four '$140')
c. cin sei (THOUSAND four '$1400')
d. maan sei (TEN.THOUSAND four '$14000')

(40) a. *go sei hou (*GO* four ten.cents '$1.4')
b. *baak sei sap (HUNDRED four TEN '$140')
c. *cin sei baak (THOUSAND four HUNDRED '$1400')
d. *maan sei cin (TEN.THOUSAND four TEN.THOUSAND '$14000')

(41) a. ?jat go sei hou (one *GO* four ten.cents'$1.4')
b. jat baak sei sap (one HUNDRED four TEN'$140')
c. jat cin sei baak (one THOUSAND four HUNDRED '$1400')
d. jat maan sei cin (one TEN.THOUSAND four THOUSAND '$14000')

(42) a. ?? jat go sei (one *GO* four '$1.4')
b. ?? jat baak sei (one HUNDRED four '$140')
c. ?? jat cin sei (one THOUSAND four '$1400')
d. ?? jat maan sei (one TEN.THOUSAND four '$14000')

To conclude the category of the monetary unit *go*:

(43) In Hong Kong Cantonese, *go* functions as a numerical base in monetary expressions.

Condition (36b) says that the monetary *go* must be followed by a bare numeral. This again addresses Au Yeung's observation that the numerical base *go* is different from other numerical bases. While other numerical bases can terminate a numerical expression (e.g. (44a, b)), the monetary *go* cannot (e.g. (44c, d)):

(44) a. saam baak (three HUNDRED '$300')
b. saam cin (three THOUSAND '$3000')
c. *saam go (three *GO* '$3')[13]
d. saam go saam (three *GO* three '$3.3')

As we mentioned before, typologically it is very rare to find real-language examples for 'one' used as a numerical base. Hurford (1987, 2007) describes this observation by a functional/conceptual account. He claims that numerals stand out from other lexical items in that the former is inherently ordered. In language acquisition, a child acquires the lexical meaning of numerals by means

13 Instead the bare expression *saam man* 'three dollars' can be used. It shows that *man* 'dollar' is not a numerical base.

of counting strategy. Moreover, it is such a counting strategy which enables the children to refer to objects *as a group and a subgroup*. For instance in English, any child needs to recite the sequence 'one, two, three, four, five, six' before he or she induces that the set contains six objects as a group. For objects with a larger set (e.g. fourteen), given the list of counting numerals, the child will separate the large set into two subgroups based on the sequence he or she has acquired. As a result, two recited sequences are elicited, namely 'one, two, three,…, ten' as one subgroup, and 'one, two, three, four' as another one. From this, it becomes obvious why the numeral 'one' cannot form a numerical base. A child may not be able to conceptualize a single object as forming a group itself. Since the major function of a numerical base is a multiplicand (i.e. counting of subgroups), a child is unable to conceptualize the numeral 'four' as 'four ones', or the numeral 'five' as 'five ones', etc. On the other hand, 'ten' is a potential numerical base since any child acquiring the recital sequence from one to ten is able to conceptualize 'ten' as a group which contains ten objects.

This conceptual account extends to the monetary *go*. In monetary recitation, a child will need to recite different sequences depending on the units. For the unit of *man* 'dollar', the following list is usually recited:

(45) jat man, loeng man, saam man, … , sap man…
one dollar two dollar three dollar ten dollar
'\$1, \$2, \$3, … \$10…'

For the unit of *hou* 'ten cents', another list is used for recitation:

(46) baat hou, gau hou, jat man, go jat, go ji, go saam, … ,
eight ten.cents nine ten.cents one dollar *GO* one *GO* two *GO* three
loeng man, loeng go jat…
two dollar two *GO* one
'\$0.8, \$0.9, \$1, \$1.1, \$1.2, \$1.3…, \$2, \$2.1…'

A child reciting the sequence (45) will eventually conceptualize that *man* 'dollar' functions as a measure unit noun. On the other hand, the sequence (46) is more interesting. It really appears that *go* functions as a numerical base, but *in both directions*. Based on (46), the child will conceptualize that in monetary expressions, the immediately preceding numeral of *go* denotes a single digit (i.e. with the base ten to the power of zero) (e.g. $5=5\times10^0$), whereas the immediately following numeral of *go* is base ten to the power of minus one (e.g. $0.5=5\times10^{-1}$). The function of *go* therefore partitions the power of zero and the power of minus one:

(47) In Hong Kong Cantonese, the monetary *go* is a numerical base ten to the power of zero. It partitions the monetary expressions of dollars and ten cents.

Assuming that (47) is correct, condition (36c) will be self-descriptive. The preceding numerals only include bare numerals to the power of zero (base 10).

They exclude numerical bases such as *baak* 'hundred', *cin* 'thousand', *maan* 'ten thousand'. All examples in (48) are ungrammatical:

(48) a. *saam baak go saam (three hundred *GO* three '$300.3')
b. *jat baak go sei (one hundred *GO* four '$100.4')
c. *ng maan go cat (five ten.thousand *GO* seven '$50000.7')

Instead *man* 'dollar' and *hou* 'ten cents' are used to express the same amount, i.e. (49). Notice that in all these cases, *ling* 'zero' can optionally precede the unit of cents:

(49) a. saam baak man (ling) saam hou
three hundred dollar zero three ten.cent '$300.3'
b. jat baak man (ling) sei hou
one hundred dollar zero four ten.cent '$100.4'
c. ng maan man (ling) cat hou
five ten.thousand dollar zero seven ten.cent '$50000.7'

On the other hand, the numeral *sap* 'ten' can be a preceding numeral. Both expressions in (50) are grammatical:

(50) a. sap go saam (ten *GO* three '$10.3')
b. sap man (ling) saam hou (ten dollar zero three ten.cent '$10.3')

As we mentioned before, the acquisition of object groupings conceptually stems from counting (Hurford 2007). It is natural to assume that English 'ten' and Cantonese *sap* are one primitive counting numeral. It just turns out that 'ten' bears a dual function in counting, namely it is the last numeral of a subgroup, and moreover a numerical base for the construction of a bigger subgroup. To generalize:

(51) In Hong Kong Cantonese, *sap* 'ten' possesses the dual category of a bare numeral and a numerical base.

In condition (36d), the following numerals are similar to the preceding numerals, except in the expression of 'fifty cents' by *bun* 'half' (e.g. (52a)). On the other hand, *bun* cannot be used with *man* 'dollar' (e.g. (52b)). Instead the unit *hou* 'ten cents' needs to be spelled out:

(52) a. saam go bun/*ng (three *GO* half/five '$3.5')
b. *saam man bun (three dollar half '$3.5')
c. saam man ng hou (three dollar five ten.cents '$3.5')

The co-occurrence of *bun* 'half' and *go* on one hand (e.g. (52a)), and the co-occurrence restriction between *bun* and *man* on the other hand (e.g. (52b)), is highly suggestive of the entire monetary structure formed by *go* and *man*, respectively. In English, the following two monetary expressions are synonymous (albeit with stylistic distinctions). Notice that the noun 'dollar' is not overt:

(53) a. three fifty '\$3.50'
b. three and a half '\$3.50'

Provided that (53a, b) are uttered in particular contexts, 'fifty' in (53a) will refer to 'fifty cents', whereas 'half' in (53b) refers to 'half dollar'. Notice that both examples in (53) are uttered without any overt monetary unit, contrary to Cantonese in which *go* must be used monetarily. We therefore claim that *bun* combines with another numeral with *go*, and the whole numerical expression modifies the silent noun DOLLAR. Recall (26) that all value-denoting expressions modify the silent noun VALUE. As a result, *saam go bun* '\$3.5' should have the following grammatical structure in (54a), with the claim stated in (54b):

(54) a. *saam go bun* DOLLAR VALUE$_{\$}$ (three *GO* half DOLLAR VALUE)
b. The monetary *go* precludes the use of an overt *man* 'dollar'.

Again, the function of *go* is a numerical base here, i.e. it partitions the unit of dollars and the unit of ten cents. What is peculiar is that *bun* is used instead of *ng* 'five' provided that the context of monetary expressions is salient (cf. the use of *bun* in clock time expressions will be discussed later).

1.4. *Go ≠ dim*

Matthews and Yip (2011) suggest that the monetary unit *go* is compatible with *dim* 'point' which is used in the expression of decimals. Compare the two expressions in (55). (55a) represents a simple numerical figure with decimals, whereas (55b) is a monetary expression:

(55) a. saam dim ji (three point two '3.2')
b. saam go ji (three *GO* two '\$3.2')

However the parallel between *go* and *dim*, while insightful, is merely partial. First, the numeral *ling* 'zero' can precede *dim* (e.g. (56a)), which is not the case for *go* (e.g. (56b)). Instead a lower base *hou* should be used to express the same amount (e.g. (56c)):

(56) a. ling dim saam (zero point three '0.3')
b. *ling go saam (zero *GO* three '\$0.3')
c. saam hou (three ten.cent '\$0.3')

Second, in monetary expressions, the numeral *jat* 'one' can be omitted without any impact on the meaning. On the other hand, for the use of *dim*, the presence or absence of *jat* is crucial:

(57) a. ?dim saam (point three '0.3')[14]
b. jat dim saam (one point three '1.3')
c. go saam (*GO* three '\$1.3')

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[14] Notice that *dim saam* without a preceding numeral is grammatical which means '0.3'.

d. ??jat go saam (one *GO* three ‘$1.3’)

Third, *bun* ‘half’ can be used after *go*, whereas it is strictly banned for *dim*:

(58) a. saam dim <*bun/ng> (three point half/five ‘3.5’)[15]
b. saam go <bun/*ng> (three *GO* half/five ‘$3.5’)

However it is interesting to note that *dim* in decimal expressions bears a similar partitioning function with *go*. For instance, *dim* in *saam dim ji* ‘3.2’ partitions the preceding numeral (i.e. *saam* ‘three’) to the power of zero, with the following numeral (i.e. *ji* ‘two’) to the power of minus one. Another reason we bring up the discussion of *dim* is that *dim* can be used in the expression of clock time, which we think is closely related to monetary expression (see section 2).

1.5. *Man* ≠ *go*

Recall that in addition to *go*, *man* ‘dollar’ is widely used. The following observations strongly suggest that *man* and *go* are in complementary distribution. First, *man* does not obligatorily require a following numeral, which is radically different from *go*:

(59) a. saam man (three dollar)
b. *saam go (three *GO*)

Second, even when *man* can be followed by a smaller monetary unit (e.g. cents), the following numeral must be accompanied by a corresponding monetary unit (e.g. *hou*). On the other hand, *go* merely requires a following numeral which is bare. Observe the following contrast:

(60) a. *saam man ji (three dollar two ‘$3.2’)
b. saam man ji hou (three dollar two ten.cents ‘$3.2’)
c. saam go ji (three *GO* two ‘$3.2’)
d. *saam go ji hou (three *GO* two ten.cent ‘$3.2’)

Third, *man* obligatorily requires a preceding numeral, including the bare numeral *jat* ‘one’. On the other hand, *jat* ‘one’ is almost obligatory before *go* (cf. (37)):

(61) a. *man (one dollar ‘$1’)
b. jat man (one dollar ‘$1’)
c. go ji (*GO* two ‘$1.2’)
d. ??jat go ji (one *GO* two ‘$1.2’)

Fourth, as shown in (54b), *go* precludes the overt noun *man* ‘dollar’:

(62) *saam go saam man (three *GO* three dollar ‘$3.3’)

However, it is clear that while *man* and *go* are in complementary distribution, it

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[15] Note that the expression *saam dim bun* is grammatical and moreover interpretable in the expression of clock time (i.e. 3:30), which will be discussed in the coming section.

does not entail that they are categorically identical. Instead the complementary distribution can be accounted for by postulating that *go* forms a larger numeral structure and the composite structure modifies a silent noun DOLLAR, which furthermore modifies another silent noun VALUE (cf. (54a)). To schematize:

(63) Num *go* Num DOLLAR VALUE

The schema (63) seems to implicate that *go* functions like a conjunction. The question is, are numerical bases syntactic conjunctions?[16] The answer seems to be no. It is mainly because numerical bases are numerals which happen to name a subgroup for further multiplication (i.e. a multiplicand). A multiplicand is conceptually distinct from a syntactic conjunction whose function is to conjoin items. In this regard, it is crucial to distinguish the mathematical relation between multiplication and addition from their conceptual and acquisitional relations. A similar claim was proposed by Hurford (1987: 211):

> "[T]he evolutionary relationship between addition and multiplication is not as conveyed by the usual picture of multiplication as serial addition. Multiplication emerges from pluralization, and addition from conjunction. In principle, although both multiplication and addition arise, I claim, from the same psycho-ontological scheme of aggregates and collections, a language could possibly develop multiplicative constructions before additive constructions."

To conclude from the aforementioned observation:

(64) In Hong Kong Cantonese, the monetary *go* is a numerical base for a complex numeral expression which modifies the silent noun 'dollar'. The monetary *go* precludes *man* 'dollar' as the overt noun.

2. The clock time unit *dim*

While we have provided counterexamples against Matthews and Yip's claim that the monetary *go* should be treated identically with the decimal marker *dim* 'point', in HKC, *dim* is widely used in clock time notation (cf. Mandarin *dian*). At first glance, we notice an interesting parallel between the monetary *go* and the clock time unit *dim* (henceforth the temporal *dim*). Let us start with some basic examples:

(65) a. jat dim (one point '1:00')
b. sap-ji dim (twelve point '12:00')

The use of the temporal *dim* is surrounded by numerals without any surprise. The encyclopedia knowledge conditions that the preceding numerals of the temporal *dim* range from *jat* 'one' to *sap ji* 'twelve', mirroring the twelve clock segments on an analog clock. Furthermore, the conditions on the use of numerals surrounding the temporal *dim* are as follows:

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16 We thank one reviewer for pointing out the potential problems of treating *go* as a conjunction.

(66) a. The temporal *dim* can be preceded by an overt numeral.
b. The temporal *dim* can be followed by an overt numeral.
c. The preceding numerals include: *jat* 'one', *ji* and *loeng* 'two', *saam* 'three', *sei* 'four', *ng* 'five', *luk* 'six', *cat* 'seven', *baat* 'eight', *gau* 'nine', *sap* 'ten', *sap jat* 'eleven' and *sap ji* 'twelve'.
d. The following numerals include: *jat* 'one', *ji* 'two', *saam* 'three', *sei* 'four', *ng* 'five', *cat* 'seven', *baat* 'eight', *gau* 'nine', *sap* 'ten', *sap jat* 'eleven', *bun* 'half', *leng* 'a few'

Condition (66a, b) shows that the preceding and following numerals are optional, e.g.:

(67) a. dim jat (point one '1:05')
b. jat dim (one point '1:00')

For (66c), the list of preceding numerals corresponds to the twelve clock segments which are unsurprising. For (66d), the following numerals also correspond to the twelve clock segments. In such case, the numerals which follow *dim* are differentiated by multiples of five minutes. Consider the following examples:

(68) a. jat dim jat (one point one '1:05')
b. jat dim ji (one point two '1:10')
c. jat dim saam (one point three '1:15')
d. jat dim sap jat (one point ten one '1:55')

Similar to the monetary *go*, the temporal *dim* can be followed by *bun* 'half' which means 'thirty minutes', and *leng* 'a few'. On the other hand, *luk* 'six' cannot follow the temporal *dim*:

(69) jat dim <bun/*luk> (one point half/six '1:30')

We therefore assume that clock time expressions can be treated analogously with monetary expressions. This being the case, the syntactic category of the temporal *dim* is a numerical base similar to the monetary *go*. The main distinction between monetary and temporal expressions is that the numerical base of the former is to the power of ten, whereas the one of the latter represents the relation between hours, the twelve clock segments,[17] and minutes (i.e. 1 hour = 12 clock segments, 1 clock segment = 5 minutes). In Cantonese temporal expressions, the preceding numeral represents the hour, whereas the following numeral denotes the twelve

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[17] Cantonese call the twelve clock segments *zi* (lit. Chinese character), which can be used to mean an interval of five minutes:

(i)	Keoi	leong	go	zi	zihau	wui dou.
	he	two	Cl	character	after	will arrive

'He will arrive in ten minutes.'

Tang (2012) suggests that in Cantonese, *zi* bears a nominal property since it must be preceded by a classifier (e.g. *go*).

clock segments, an immediately smaller temporal unit. The entire numeral modifies the silent noun TIME_{hour}. To schematize:[18, 19]

(70) Num-*dim* Num TIME_{hour}

In addition, the use of the temporal *dim* seems more complicated than the monetary *go*. *Dim* is also widely used with numerals which express the minutes (besides the use of the twelve clock segments). Consider the following list of examples:

(71) a. saam dim sap fan (three point ten minute '3:10')
b. saam dim ji-sap saam fan (three point twenty three minute '3:23')

Notice that in (71), the unit *fan* 'minute' must be overt, otherwise the interpretation will change, as shown in (72):

(72) saam dim sap (three point ten '3:50', not '3:10')

We therefore assume that (71) expresses a coordinating structure, similar to the combination between *man* and *hou* (cf. (26b)). The numerical expressions formed by *dim* and *fan* modify the silent noun TIME_{hour} and TIME_{minute}, respectively:

(73) Num-*dim* TIME_{hour} AND Num-*fan* TIME_{minute}

Sometimes, the position of TIME_{hour} can be overt. For instance the noun *zung* 'clock' is felicitously used if the clock time only specifies the unit of hours:

18 Cantonese speakers may consider that the expression *saam dim jat* (three point one '3:05') as deriving from the following expressions (Cheung 2007: 330)

(i) saam dim daap jat (three point step one '3:05')
(ii) saam dim jat go zi (three point one Cl character '3:05')

While both are tenable proposals, the usage of (ii) seems to fade out in HKC. That is to say, modern HKC generally does not tend to make use of a numeral classifier structure for *zi* 'Chinese character'. Another obsolete usage is the word *gwat* 'quarter', as in:

(iii) saam dim jat go *gwat* (three point one Cl quarter '3:15')

On the other hand, (i) remains to be a common usage in HKC. While the syntactic status of *daap* 'step' remains puzzling, we notice that it functions as an ordinal marker, e.g.:

(iv) A: Jigaa daap gei aa? (now step what PRT 'What time is it?')
B: Daap saam. (step three '15 minutes')

In particular, *daap* only combines with a following numeral in temporal expressions.

19 One caveat is in order: schema (70) merely applies to the expression of time, not the period of time. Similar to other Chinese dialects, another set of temporal units is used to express the time period (cf. 'year', 'month', 'day'). Notice that the following units have different combinations with the preceding classifiers:

(i) siu si 'hour' (can be preceded by classifier),
(ii) zung tau 'hour' (must be preceded by a classifier)
(iii) zi 'five minutes' (must be preceded by a classifier)
(iv) fan zung 'minute' (cannot be preceded by a classifier)
(v) miu 'second' (cannot be preceded by a classifier)

See Lu (1987) and Tang (2012) for more discussion about expressions of time periods in Chinese.

(74) a. saam dim zung (three point clock ‘3:00’)
b. saam dim bun zung (three point half clock ‘3:30’)
c. *saam dim jat zung (three point one clock ‘3:05’)
d. ??saam dim ng fan zung (three point five minute clock ‘3:05’)

The difference between $\mathrm{TIME}_{\mathrm{hour}}$ and $\mathrm{TIME}_{\mathrm{minute}}$ is also observed by its collocation with the temporal adverb *zing* ‘straight’:

(75) a. saam dim zing (three point straight ‘3:00 sharp’)
b. *saam dim sei zing (three point four straight ‘3:20 sharp’)
c. ??saam dim sap fan zing (three point ten minute straight ‘3:10 sharp’)

To conclude:

(76) In Hong Kong Cantonese, the temporal unit *dim* and *fan* function as a numerical base which modify the silent noun $\mathrm{TIME}_{\mathrm{hour}}$ and $\mathrm{TIME}_{\mathrm{minute}}$ respectively.

3. Conclusion

In this paper, we study how Hong Kong Cantonese (HKC) expresses monetary units and clock time. The three monetary units in HKC are *man* ‘dollar’, *hou* ‘ten cents’, and *go*. We conclude that the monetary expressions formed by *man* and *hou* modify the silent noun $\mathrm{VALUE}_{\$}$ and $\mathrm{VALUE}_{¢}$ respectively. They are combined by means of simple conjunction. The monetary unit *go* functions as a numerical base, and moreover forms a complex numerical expression for modification of the silent noun DOLLAR. All monetary expressions, given their value-denoting nature, essentially modify the silent noun VALUE. On the other hand, the clock time unit *dim* ‘point’ functions similarly to the monetary *go* in the sense that both can be numerical bases. Clock time expressions are more complicated since they represent the grouping relations between hours, the twelve clock segments, and minutes. By default, *dim* mediates between the unit of hours and the twelve clock segments. If a more accurate temporal expression is needed, the Num-*dim* sequence will combine with another temporal structure formed by *fan* ‘minute’. Similar to monetary expressions, all temporal expressions essentially modify the silent noun TIME. Moreover the Num-*dim* sequence can further modify the overt noun *zung* ‘clock’ and select the temporal adverb *zing* ‘straight’.

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時間就是金錢：香港粵語的一些語法論證

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提要

本文旨在研究香港粵語的貨幣表達式與時間表達式。對於貨幣表達式，本文將討論香港粵語“蚊”與“毫”的用法，以及論證“個”字於貨幣表達式的語法功能為數值基數。本文認為貨幣表達式修飾無聲名詞“價值”。對於時間表達式，本文認為時間單位“點”跟“個”都能作為數值基數。香港粵語之時間表達式較為複雜，其主要原因在於時間被系統劃分為時、字及分。跟貨幣表達式類同，所有時間表達式都修飾無聲名詞“時間”。

關鍵詞

數值基數，貨幣單位，時間單位，無聲名詞