The GF Approach to Chinese

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The 3 rd GF Summer School

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Outline

- Introduction to T-rater

- Problems of Chinese semantic processing inT-rater

- Possibilities of adopting GF in T-rater

- Reflections on the application of GF in other foreign language learning systems

1. Introduction to T-rater

- Online autonomous foreign language learning is popular in the era of the Internet, which calls for instant automated assessment and feedback

- Five foreign language skills are required in China: listening, reading, speaking, writing and translating

- T-rater: an online instant automatic scoring and feedback system for Chinese college

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A baby elephant can walk shortly after it is born. Only a few weeks after they are hatched, birds can fly away from the nest to find their own food. Animals mature rather quickly. A human baby, however, is helpless for a long time. Its slow development makes it dependent on adults for many years. <u>1. Adults must cooperate to provide the food, warmth, and protection necessary for a child's growth to maturity, and they must provide some kind of family for the human child.</u>

Thousands of years ago men and women lived by hunting animals and gathering wild plants. People had few possessions and no permanent home. They had to move from one area to another in search of food. They lived in small units of a mother, a father, and children. Social scientists call this the elementary or nuclear family. The nuclear family was well adapted to this hunting and gathering society. Even with several children, it was small enough to move easily from place to place. <u>2. Each family was independent, but sometimes several related families camped together for companionship and the chance to communicate their ideas and experiences.</u>

As time passed, people discovered how to plant food and to tame wild pigs, goats, and other animals. With farming, a new type if family structure developed: the extended family. Several generations of the same family lived together in a permanent place. This arrangement provided many workers for the family farm. When older workers died, the farmland continued in the hands of the younger generations. Many healthy children were important for the survival of the family and the land.

majorities of the world's people live in this way and have these ideas.

The modern nuclear family, living in an industrial society, has a different set of ideas. In North America and Europe, economic success often depends on the ability of people to move from one city to another. The nuclear family today is adapted to apartment living in urban centers, small homes in suburban areas, or individual farmhouses. Such a family may live far from relatives. Some children don't have a close relationship with aunts, uncles, or grandparents. Their interests and activities lie more with those of other generations. 4. In the nuclear family, children are educated to become independent and follow their own careers. A person is expected to be economically and socially independent in old age.

There are weaknesses in the nuclear family structure as it exists today. It can be broken by divorce or the death of a parent. Even with two parents, children sometimes don't get enough attention or love. Then, too, there is the problem if caring for the elderly without strong family support. Loneliness can be a problem for young and old alike. Nevertheless, the nuclear family will survive. 5. In fact, social scientists predict that there will be more independent nuclear families in the future because extended families will separate into basic nuclear units. They say that the world becomes increasingly industrialized, there will be little place left for extended family farms and businesses. But perhaps some of the extended family ideals will survive and give renewed strength to modern family life.

答题区

1. Adults must cooperate to provide the food, warmth, and protection necessary for a child's growth to maturity, and they must provide some kind of family for the human child.

成人必须合作，为孩子走向成熟提供所需的食品、温度和安全，还有家庭。

2. Each family was independent, but sometimes several related families camped together for companionship and the chance to communicate their ideas and experiences.

每一个家庭是独立的，但有时几个有关系的家庭会结伴一起露营，有机会交流思想和经历。

2. Each family was independent, but sometimes several related families camped together for companionship and the chance to communicate their ideas and experiences.

每一个家庭是独立的，但有时几个有关系的家庭会结伴一起露营，有机会交流思想和经历。

3. The marriage union is important, but blood ties between the generations are still very strong, so the family continues through time as a permanent unit.

婚姻的联合是很重要的，但几代人之间的血缘纽带依然很强，所以家庭作为永久的单元继续维系着。

4. In the nuclear family, children are educated to become independent and follow their own careers. A person is expected to be economically and socially independent in old age.

在小家庭中，孩子被教育成为独立的人，并追求自己的事业。一个人被期望成年后在经济上和社会生活上独立。

5. In fact, social scientists predict that there will be more independent nuclear families in the future because extended families will separate into basic nuclear units.

事实上，社会科学家预测，未来将有更多更加独立的小家庭存在，因为大家庭将分开成为基本的小家庭。

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您的成绩及标准译文如下:

sentence	score	Standard answer
1	13.5	大人们必须为孩子长大成人提供必要地食物、衣服和其他必要地保护，并且他们必须为孩子提供某种家庭环境。
2	17.0	每个家庭都是独立的，然而，有时几个有一定关系的家庭为了彼此为伴以及互相交流思想和感受的需要而住在一起。
3	15.8	婚姻的联盟很重要，然而维系一代一代人的血缘关系仍然非常牢固，从而使这一家庭作为一个永恒的单位而持久延续下去。
4	16.5	在核心家庭中，孩子们为了将来能够独立生活并从事自己的事业而受到教育。人们期望一个人年老时在经济上和社会意义上时独立的。
5	16.1	事实上，社会学家们预言说，将来会有更多的独立的核心家庭，因为大家庭会分裂为基本的核心单位。
total	78.9	

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Here is your English translation exercises result:
        sentence1:          13.5
        sentence2:          17.0
        sentence3:          15.8
        sentence4:          16.5
        sentence5:          16.1
        total:                 78.9
And the correct answers are as follow
        sentence1:          大人们必须为孩子长大成人提供必要地食物、衣服和其他必要地保护，并且他们必须为孩子提供某
        sentence2:          每个家庭都是独立的，然而，有时几个有一定关系的家庭为了彼此为伴以及互相交流思想和感受的
        sentence3:          婚姻的联盟很重要，然而维系一代一代人的血缘关系仍然非常牢固，从而使这一家庭作为一个永恒
        sentence4:          在核心家庭中，孩子们为了将来能够独立生活并从事自己的事业而受到教育。人们期望一个人年老
        sentence5:          事实上，社会学家们预言说，将来会有更多的独立的核心家庭，因为大家庭会分裂为基本的核心单
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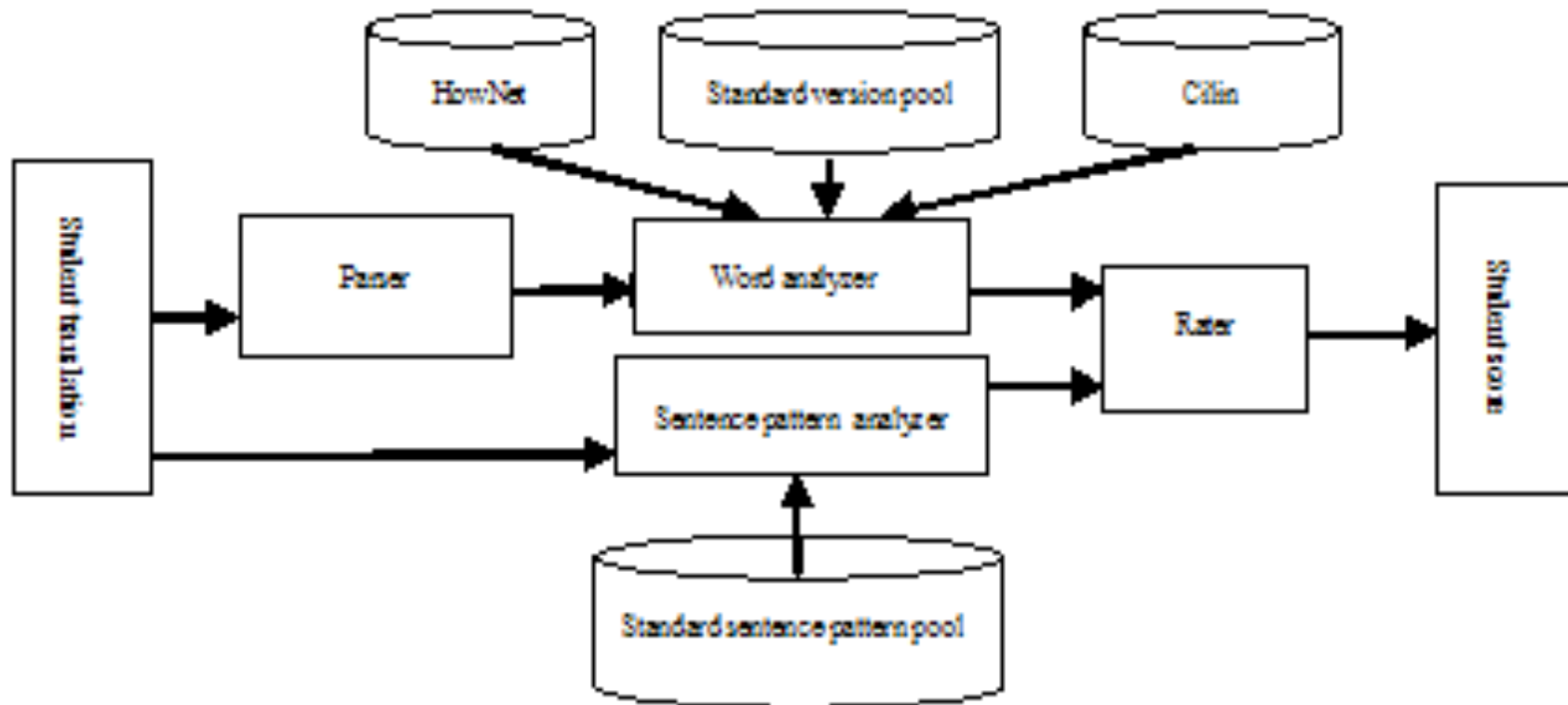
2. Problems of Chinese semantic processing
 in T-rater

- 'Translating means translating meaning.˜ (Nida, 1986)
- Syntactic meaning is a very important compositional   part of sentence meaning
- Automated translation scoring should be done at semantic levels:
  - Word meaning
  - Phrase meaning
  - Sentence meaning

- **T-rater:**

  - To adopt both holistic scoring and partial scoring

  - To simulate the manual translation scoring practice in which the sentences are scored according to the correct translation of language points (words and phrases) and that of sentence structures.

The free online version of (SharpICTCLAS. net) of ICTCLAS (Institute of Computing Technology, Chinese Lexical Analysis System) of the Chinese Academy of Sciences is used to tag the part of speech of students' translations as well as the standard versions.

- 然而/c ，/w 这个/rd 世界/n 就/d 是/v 如此/rz ，/w 以致/c 于/p 完美/a 的/uj 体系/n 大体上/d 无法/v 处理/v 一些/m 世界/n 上/f 更/d 迷人/a 更/d 悦/vg 人/n 的/uj 东西/n 。/w

Problem 1:

- No ideal Chinese parser reliable enough for T- rater to parse syntactically

- ICTCLAS was not applied in the syntactic analyzing of the standard versions and the studentsẠ translations.

- T-rater cannot process Chinese sentence meaning in the real sense.

- **Sentence Patterns:**

  - For example:

  - <u>I shall define him as an individual who has</u> <u>elected as his primary duty and pleasure in</u> <u>life the activity of thinking in Socratic way</u> <u>about moral problems</u> .

  - 我会把知 识分子定义为这样的人：他把用苏格拉底方式思考道德问题作为人生的主要任务和乐趣。

- 1）把……定 义为（将……定义为）
- 2）以……方式思考(用……方式思考、 选择……方式思考、像……一样思考）
- 3）把……作 为（将……作为）
- 4）主要(首要、重要)
- 5）义务（任务、工作、责任、职责）
- 6）和 乐趣（快乐）

- (把 | 将).+ 定义为
- (((以 | 用 | 选择).+ 方式)|(像 .+ 一样)) 思考
- (把 | 将).+ 作为
- (主要 | 首要 | 重要)
- (义务 | 任务 | 工作 | 责任 | 职责)
- 和 (乐趣 | 快乐)

Sentence Pattern Analyzer:

- Matching student translations with the sentence patterns in 'Standard sentence pattern pool˜

- Scoring is performed on sentence level.

- T-rater:

  - Word sense processing with the aid of :

    - HowNet

    - Cilin

- HowNet :www.keenage.com

- The primitives provided by HowNet are used to calculate the semantic similarity of *verbs*, *adjectives* and *adverbs* between the words in 'Standard version pool˜ and those in student translations

-entity ｜实体
｜-thing ｜万物〔#time ｜时间，#space ｜空间〕
`H｜-physical ｜物质〔｜appearance ｜外观〕
        `H｜-animate ｜生物〔*alive ｜活着，｜age ｜年龄，
*die ｜死，*metabolize ｜代谢〕
`H｜-AnimalHuman ｜动物〔!sex ｜性别，
*AlterLocation ｜变空间位置，*StateMental ｜精神状态〕
`H｜-human ｜人〔!name ｜姓名，｜wisdom ｜智慧，｜
ability ｜能力，｜occupation ｜职位，*act ｜行动〕
｜∟humanized ｜拟人〔fake ｜伪〕
`animal ｜兽〔^*GetKnowledge ｜认知〕
｜-beast ｜走兽〔^*GetKnowledge ｜认知〕

`H

The Primitives of 生活（live, life）in HowNet

Hownet System

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Keyword: 生活
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G_C=V
E_C=
W_E=live
G_E=V
E_E=
DEF=alive|活着

生活
  alive|活着
  attribute|属性,circumstances|境况,

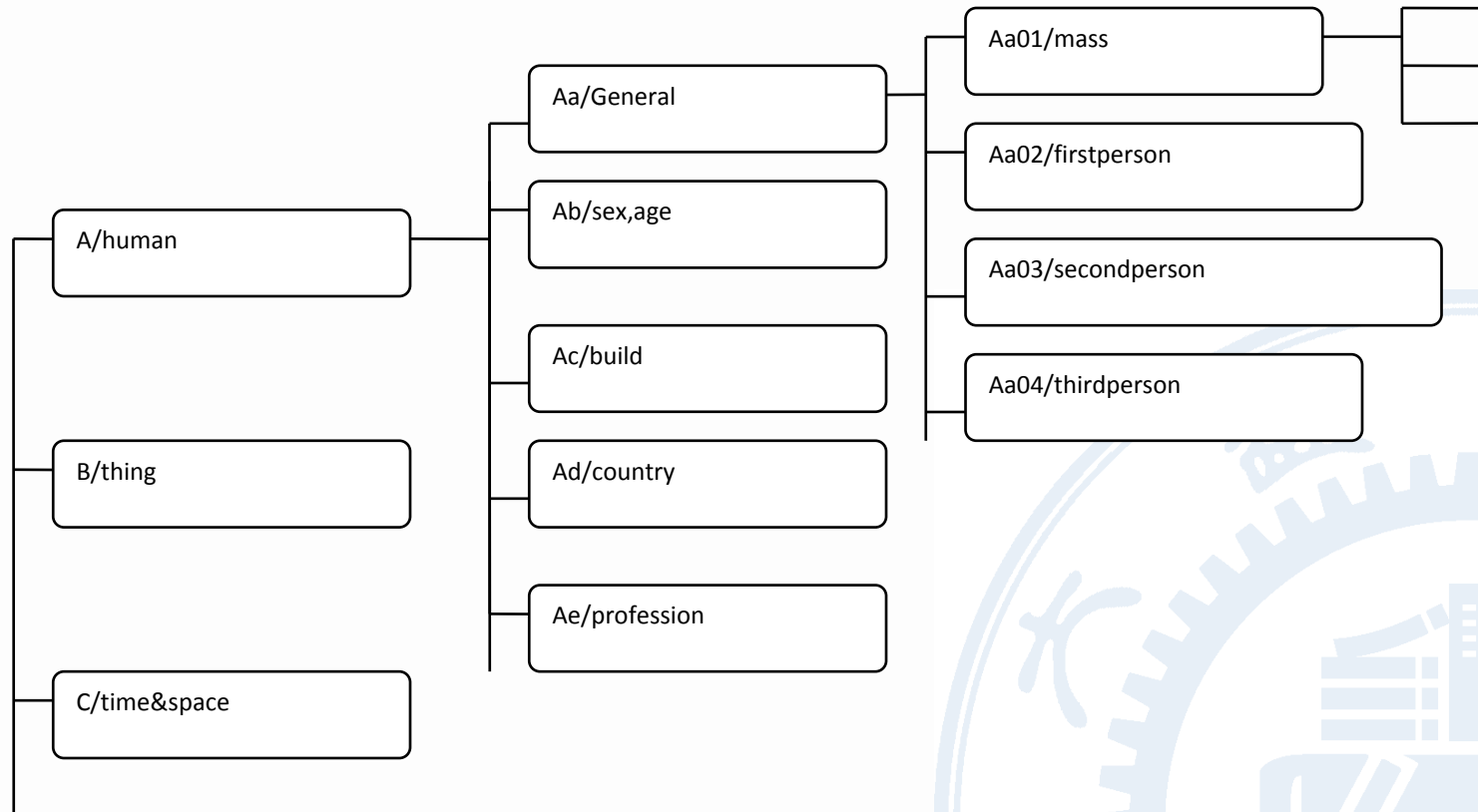Edit   Close

Ready   2 unit(s) found

- Cilin:

    - Chinese synonym set

The Semantic Category of Chinese Words in Cilin

- A/human
  - Aa/General
    - Aa01/mass
    - Aa02/firstperson
    - Aa03/secondperson
    - Aa04/thirdperson
  - Ab/sex,age
  - Ac/build
  - Ad/country
  - Ae/profession
- B/thing
- C/time&space

- Key word matching scoring processes the *nouns* , the *pronouns* and the other part of speeches (*r*).

- The tagged nouns in the standard version, the synonyms of the nouns are searched in 'CiLin˜ to find the synonym set of the noun.

- The nouns in student translation are then matched with the synonym set to achieve semantic scoring of nouns.

- The semantic scoring of pronouns and other part of speeches are conducted in the same way.

- **Problem 2:**
  - **Not all words with part of speech tags are processed semantically**

    - due to HowNet design
    - the system cannot find which primitives are the right one for a specific candidate

- Key-word matching, word similarity calculating and sentence pattern matching are accurate   only to a certain degree.

3. Possibilities of adopting GF in T-rater

- (1) Automatically generate the standard Chinese versions from English
  - If so, T-rater can cover all the literal translations from students
  - Currently, three kinds of standard Chinese versions in our database:
    - Literal translation
    - Semantic translation
    - Communicative translation

  - If so, T-rater can provide feedback accurately

- Lang: ExtAdvS (ConjAdv and_Conj (BaseAdv (SubjS because_Subj (UseCl (TTAnt TPres ASimul) PPos (PredVP (UsePron i_Pron) (ComplVS know_VS (UseCl (TTAnt TPres ASimul) PPos (PredVP (MassNP (UseN love_N)) (AdvVP (UseV live_V) (PrepNP in_Prep (DetCN (DetQuant (PossPron i_Pron) NumSg) (UseN house_N))))))))) (SubjS if_Subj (UseCl (TTAnt TPres ASimul) PPos (PredVP (UsePron we_Pron) (ComplVV can_VV (ComplSlash (SlashV2a find_V2) (DetCN (DetQuant IndefArt NumSg) (AdvCN (UseN house_N) (PrepNP for_Prep (DetCN (DetQuant (PossPron we_Pron) NumPl) (UseN child_N)))))))))) (UseCl (TTAnt TPres ASimul) PPos (PredVP (UsePron i_Pron) (ComplVS say_VS (UseCl (TTAnt TPres ASimul) PPos (PredVP (DetCN (DetQuant IndefArt NumSg) (AdjCN (UseComparA big_A) (UseN love_N))) (ComplVV can_VV (PassV2 find_V2)))))))

◎ LangChi: 因 为 我 知 道 爱 在 我 的 房 子 里 活 所 以 如 果 我 们 能 发 现 一 间 为 了 我 们 的 孩 子 的 房 子 ， 我 说 一 更 大 的 爱 被 能 发 现

- (2) Automatically generate the translation exercises from English to Chinese and Chinese to English, focusing on specific translation skills.
- For example:
  - Part of speech transfer
  - Addition
  - Omission
  - From negative to positive
  - From positive to negative
  - `H`H

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- **4. Reflections on the application of GF in other foreign language learning systems**

- Vocabulary exercises
- Pattern drills
- Grammar exercises
- `H`H

- For example: an online Chinese learning system with the automatic scoring and instant feedback

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Grammar: Bird.pgf ▾ **From:** Chi ▾ **To:** Eng ▾
Quiz Mode: Easy Study Mode ▾   Restart Quiz   End Quiz

Quiz Question:

```
2. 这 个 非 常 安 静 的 鹰 是 美 国 的
```

Your Answer:

⌫   Clear

that   this

< Previous Question   Next Question >   Hint   Check Answer

Explanation:

```
Yes, that was the correct answer.
```

Current Quiz Mode: **Answered Questions**   **Your Score**

Easy Study Mode   1   1

↓ 0K/S ↑ 0K/S

23:42
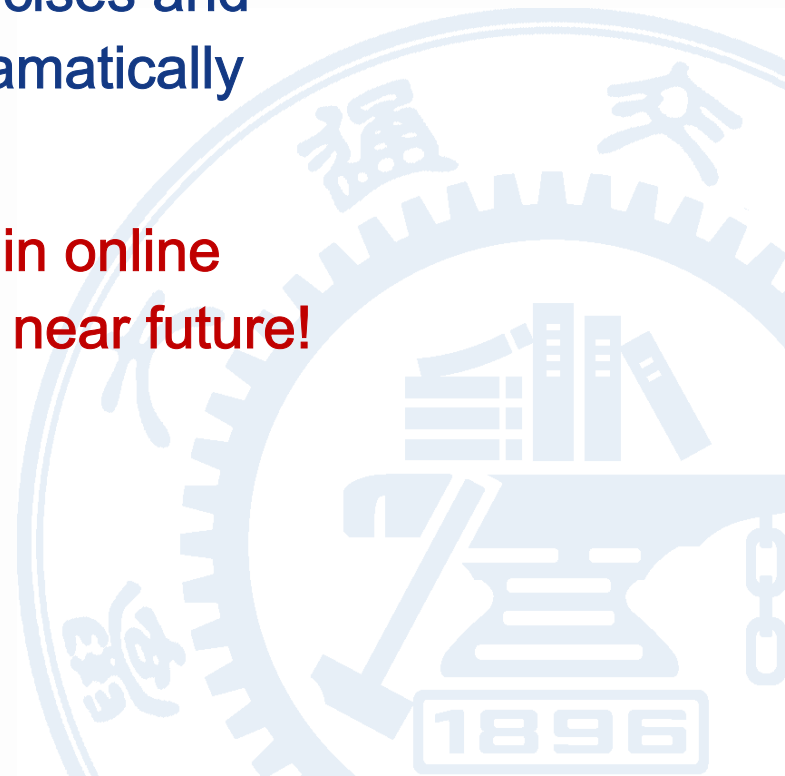2013/8/20

Conclusion:

- Foreign language learning has reached the stage of E-learning

- Online automatic language exercises and instant feedback are needed dramatically

- GF can be applied successfully in online foreign language learning in the near future!

Thank you very much!