Fantastic Expressions and Where to Find Them: Chinese Simile Generation with Multiple Constraints

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Abstract

Similes occur in the creative context of describing a concept (i.e., tenor) by making a literally false yet figuratively meaningful comparison to another (i.e., vehicle). Previous efforts form simile generation as a context-free generation task, focusing on simile-style transfer or writing a simile from a given prefix. However, generated texts under such settings might be undesirable, such as hardly meeting the simile definition (e.g., missing vehicle) or difficult to address certain preferences of content as humans wish (e.g., describe the color of apples through the simile). We believe that a simile could be more qualified and user-oriented if incorporated with pre-specified constraints. To this end, we introduce controllable simile generation (CSG), a new task that requires the model to generate a simile with multiple simile elements, e.g., context and vehicle. To facilitate this task, we present GraCe, including 61.3k simile-element annotated Chinese similes. Based on it, we propose a CSG model Similor to benchmark this task, including a vehicle retrieval module Scorer to obtain the explicable comparison for a given tenor in the vehicle-unknown situation. Both statistical and experimental analyses show that GraCe is of high quality beyond all other Chinese simile datasets, in terms of the number (8 vs. 3) of annotation elements, Is-Simile accuracy (98.9% vs. 78.7%), and increasing model-performance gains for both uncontrollable and controllable simile generation. Meanwhile, Similor can serve as a strong baseline for CSG, especially with Scorer, which beats model-based retrieval methods without any re-training.

1 Introduction

Similes are widely-used and stimulate people's creativity (Li et al., 2022). According to Rhetoric's classical terms (Campbell, 1988), a simile uses



Figure 1: Toy examples to explain element-incomplete and -mismatched generated results from a given prefix. Translations are provided for non-Chinese speakers.

comparison words (i.e., *comparator*) to make a literally false comparison between a concept (i.e., *tenor*) and another (i.e., *vehicle*). It also ensures this comparison pair is figuratively meaningful by examining whether they have shared properties (i.e., *ground*) (Tartakovsky et al., 2019). Notably, *ground* can be expressed in an explicit or implicit way (Chakrabarty et al., 2020). As shown in Figure 1 qualified samples. "Maple leaves are like torches of fired red." has the explicit *ground* that the *tenor* "maple leaves" and the *vehicle* "torches" have the similar color of "fired red", while "maple leaves are like small palms." implies the *ground* that they have a similar pentagram shape.

Although simile detection has been widely explored (Liu et al., 2018; Zeng et al., 2020; Mao and Li, 2021), simile generation is still in its fledgling stage. Existing efforts focus on context-free simile generation, including: 1) style-transfer-based and 2) prefix-based simile generation. The former paraphrases a literal sentence into its simile version (Chakrabarty et al., 2020; Zhang et al., 2021) and the latter aims at writing a simile from a prespecified *tenor* (Li et al., 2022; Chen et al., 2022). Despite great progress, such experiment settings may result in undesirable results, such as unqualified similes or being unable to meet the content

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Dataset	# Nums	# Avg.	% Is-Simile	Topic	Comparator	Tenor	Vehicle	Ground	Context
		. 8.			-	W / F	W / F	V / F	Above / Below
Poetry (2019b)	43,051	23	-	×	×	X/ X	X/ X	×	√/X
Lyrics (2019b)	246,669	23	-	×	×	XIX	X/X	X	\checkmark \land
CS (2021)	5,490,721	61	29.3%	×	×	XIX	$\boldsymbol{X}_{l}\boldsymbol{X}_{l}$	X	$\sqrt{1}$
CMC (2022)	2,787	35	78.7%	×	\checkmark	\checkmark / \checkmark	\checkmark \land	×	$\boldsymbol{X}_{l} \boldsymbol{X}_{l}$
GraCe	61,360	89	98.9%	\checkmark	\checkmark	$\sqrt{1}$	\checkmark / \checkmark	\checkmark	V / V

Table 1: Statistic characteristics and annotation information of main existing Chinese generation datasets of metaphor and simile and our GraCe dataset. \checkmark indicates that the dataset contains annotations of the corresponding item, \varkappa is the opposite. # Avg. denotes averaged tokens per sentence. W and F mean the tenor/vehicle words and the corresponding feature words, respectively. % Is-Simile denotes the average percentage of similes from 1000 randomly selected samples from each dataset, which is annotated by three professional annotators. We ignore the Poetry and Lyrics datasets because their text styles are different from the others.

preferences of humans wish. As shown in Figure 1, the former means the generated sentences may miss indispensable simile elements or generate incoherence elements, i.e., generating element-incomplete or -mismatched samples. For example, "maple leaves are small and beautiful." misses both *tenor* and *vehicle* and "maple leaves are like small green fans." has inconsistent *vehicle* "green fans" with the *context* "mountains are red". The second problem may arise when users wish to describe the color of maple leaves by similes but get "maple leaves are like small palms.", although it is qualified according to the simile definition.

To solve these problems, we explore incorporating various constraints into simile generation. Specifically, we introduce a new task of controllable simile generation (CSG) – generating a simile with multiple simile elements (e.g., vehicle, context, etc.) from a given prefix (i.e., topic). We collect a Fine-Grained annotated Chinese Simile dataset (GraCe), containing annotated 61.3k similes from 260k cleaned text of student compositions. As shown in Table 1, we expand three commonly annotated elements (i.e., tenor, vehicle and comparator) (Li et al., 2022) to eight, such as the context element that could put each simile into a more naturally-using situation (Sun et al., 2022).¹ In details, we annotate explicit ground to better understand the simile comparison. As for implicit ground, we try to interpret the relationship between tenor and vehicle by their cognitive properties. Such property is a set of adjectives that describe the distinctive features of the corresponding nouns (Veale and Hao, 2007), which helps to understand the comparison from the aspect of Cognitive

Linguistics (Kövecses, 2010). To benchmark CSG, we build the model **Similor**, which first retrieves *vehicle* (if it is unknown) by the module **Scorer** (a **Shared co**gnitive-property-based retrieval method) for the given *tenor*, then incorporates all constraints and the input prefix (i.e., *topic*) to generate the simile. Both statistical and experimental analyses show that GraCe is of high quality beyond previous Chinese simile datasets. Meanwhile, Similor can successfully incorporate the constraints in the outputs. Especially in *vehicle*-unknown setup, Scorer beats the model-based retrieval method both in automatic and human evaluations without any re-training.²

2 Related Work

Different from metaphor (Yu and Wan, 2019; Chakrabarty et al., 2021a; Stowe et al., 2021) that using implicit comparators, similes are much easier to be located. However, existing efforts mainly focus on simile detection (Liu et al., 2018; Zeng et al., 2020; Mao and Li, 2021), leaving simile generation under-explored. Previous work on context-free simile generation can be divided into: 1) styletransfer-based and 2) prefix-based simile generation. The first forms this task as paraphrasing a literal sentence into a simile-style sentence, and automatically edits self-labeled similes to their literal version for building pairs of (literal sentence, simile). For example, SCOPE (Chakrabarty et al., 2020) uses commonsense properties words (Bosselut et al., 2019) of the vehicle to replace it in a simile, then removes the *comparator* to form the final literal sentence. WPS (Zhang et al., 2021)

¹See Appendix Figure 4 for detailed annotation.

²Our code and corpus will be released at https://github.com/yangkexin/GraCe.



Figure 2: The pipeline of building GraCe. "+" illustrates that this element is annotated in the corresponding step.

deletes a span from a simile to obtain the literal sentence. The second focuses on generating the comparator and tenor from a pre-specified tenor. Liu et al. (2019b) uses a continuous latent variable as a rhetoric controller to generate Chinese poetry. CMC (Li et al., 2022) provides a multi-task framework that leverages unlabeled data to enhance performance. Chen et al. (2022) use three words triple (tenor, attribute, vehicle) and a relationship pattern to hint the model for generating simile. Different from all of them, we focus on controllable simile generation - generating a simile with multiple constraints. To make it a computationally feasible task, we build a high-quality dataset GraCe and a CSG model Similor with Scorer to ensure explicable tenor-vehicle pairs in generated similes. As shown in Table 1, GraCe is far beyond the most recent dataset CMC (Li et al., 2022) in terms of collected samples (61.3k v.s. 2.7k), simile quality (98.9% v.s. 78.7% Is-Simile accuracy) and the number of annotated elements (eight v.s. three).³

3 GraCe Dataset

A fine-grained annotated simile dataset is important both for training a supervised CTG model and exploring combinations of constraints. However, relevant datasets (Table 1) might be insufficient. Therefore, we present the GraCe dataset, and elaborate on dataset creation and analysis.

3.1 Dataset Creation

Dataset Collection We collect 260k student compositions (grades range from elementary to high school) from the free-access website,⁴ ensuring data resources are close to real-world cases. After sentence segmentation and the removal of non-

Chinese sentences, we get about 5.48 million sentences. At most two sentences above and below each sample are used as the *context* element.

Dataset Processing As shown in Figure 2, we build our GraCe dataset in four steps. In Step 1, we filter out sentences that do not contain comparator-related words. Specifically, we tokenize candidate sentences with the toolkit Jieba⁵ and filter out sentences without comparator-related words, as *comparator* is the hallmark of a simile. The *com*parator words are varied to ensure the diversity of simile patterns (e.g., "好像", "仿佛", "犹如", etc, all means "like"). However, a sentence containing comparator may not trigger a simile (Liu et al., 2018). As the example 2 in Step 1, "他还是像过 去一样喜欢打篮球。(He still likes playing basketball as before.)", here "像 (as)" implies identity rather than comparison. Therefore, Step 2 focuses on recognizing non-simile sentences containing comparator words. We train a binary classifier based on RoBERTaLarge (Liu et al., 2019a) with a confidence score of 80% to select similes.⁶ Notably, we do not pursue higher score confidence as it may face the risk of reducing patterns of simile.

After the above two steps, we get the simile dataset without fine-grained annotations. Therefore, **Step 3** aims at annotating *tenor*, *topic*, and *vehicle* for each simile. We utilize a sequence labeling model based on RoBERTa_{Large} to annotate *tenor* and *vehicle* for each simile.⁷ Meanwhile, we annotate *topic* as the span between *tenor* and *comparator*, which denotes *tenor* and its supplementary description. After that, **Step 4** furtherly aims at annotating the *ground* and cognitive properties of *tenor* and *vehicle*. As the interpretation

³The details of % Is-Simile are in Appendix C.1.

⁴https://www.hxszww.com/

⁵https://github.com/fxsjy/jieba

⁶Details of the classifier are in Appendix A.1

⁷Details of the labeling model are in Appendix A.2

Measurement	# Nums	# Average Tokens
Sentences	61,360	89.0
Ani	notated Elei	ments
Topic	61,360	11.4
Tenor	61,360	1.9
Tenor Property	52,474	73.2
Comparator	61,360	2.6
Vehicle	61,360	2.3
Vehicle Property	61,360	83.0
Ground	15,087	8.6
Context	57,543	39.5

Table 2: Core statistics of the GraCe dataset. Here *ground* denotes the explicit ground in the simile. We annotate implicit ground as the shared properties between *tenor* and *vehicle*.

Measurement	Value
% Simile	98.9
% Correct Tenor % Correct Vehicle % Correct Comparator	95.2 98.2 98.7
% Correct Ground	94.1

Table 3: Statistics of 1000 randomly selected samples from the GraCe annotated by three professional annotators. 98.9% samples are similes. The statistics of the dash line below are calculated for these similes.

for a simile comparison (Tartakovsky et al., 2019), ground plays an important role in making the *tenor-vehicle* pair of a simile being easily-understood and figuratively meaningful (Campbell and Katz, 2006; End, 1986), yet being ignored in previous datasets. We first query Cogbank dataset⁸ to obtain the cognitive properties for both *tenor* and *vehicle*. Then, their shared properties are used to fuzzy match⁹ the property-related clauses in a simile as the ground. Finally, the detailed statistics of our GraCe dataset are shown in Table 2, and some dataset samples are shown in Appendix A.4.

3.2 Dataset Analysis

Data Quality We invite three professional annotators to independently annotate 1000 randomly selected samples from multiple aspects.¹⁰ As shown in Table 3, only 1.1% samples are not similes, which is far beyond other Chinese simile datasets (see Table 1). More importantly, it maintains high accuracies even in fine-grained annotations for important elements of a simile (94.1% - 98.7%).

Measurement	Value
# Distinct Tenors	7,958
# Distinct Vehicles	5,350
# Distinct Comparators	371

Table 4: Distinct Statistics of the GraCe dataset.

Diversity of Similes We analyze the diversity of similes and present the statistics in Table 4. First, the fertility of *tenor* and *vehicle* ensure the diverse content of the simile. Besides, different from Liu et al. (2018); Chakrabarty et al. (2020) using only a single pattern comparator of simile in their dataset (i.e., "_好像 (like) _" in Chinese), we build the comparator as 371 patterns of fill-in-the-blank templets. Specifically, inspired by WPS (Zhang et al., 2021) that the position information of simile in the context is a strong feature, we incorporate it by adding the punctuation that closely followed the vehicle to our template. As shown in Appendix Figure 5, "_如同 (like) _, " means the simile part appears in the middle clause without any description after *vehicle*. If no punctuation in the template, it means there is an explicit ground or context after vehicle to complement the content.

4 Controllable Simile Generation

4.1 Task Definition

The controllable simile generation task is formulated as follows: given a *topic* \boldsymbol{x} containing a *tenor* s_t and a variety of pre-specified constraints \boldsymbol{c} , the model generates a simile $\boldsymbol{y} = (y_1, y_2, ..., y_N)$ by:

$$p(\boldsymbol{y}|\boldsymbol{x}, \boldsymbol{c}) = \prod_{n=1}^{N} p(y_n|y_{< n}, \boldsymbol{x}, \boldsymbol{c}; \theta), \quad (1)$$

where θ are the model parameters. Notably, the constraints c can be freely selected and combined from the candidate set $s = (s_v, s_p, s_c)$, which denote the *vehicle, comparator*, and *context*, respectively.

4.2 Methodology

We benchmark this task with the CSG model Similor, which contains a module Scorer for the *vehicle*-unknown situation. To ease of presentation, we start with a toy example to illustrate them.

Similor As shown in Figure 3, the *topic* "美丽的春天 (the beautiful spring)" containing the *tenor* "春天 (spring)" is firstly concatenated with optional sequential constraints by the separator signal "[SEP]". If the *vehicle* is pre-specified in

⁸https://catalog.ldc.upenn.edu/LDC2020T01

⁹See algorithmic details in Appendix A.3

¹⁰Details of human annotation are in Appendix C.1



Figure 3: A toy example to elaborate the workflow of Similor and Scorer.

the constraints, the input sequence is then fed into an encoder-decoder model. Afterward, the model auto-regressively generates "好像一幅画, 它收 集了大自然的色彩。 (is like a painting. It gathers the colors of nature.)". We first continue pretraining the large Chinese text generation model (e.g., ChineseBART (Shao et al., 2021)) on the collected 260k student compositions with the language modeling object. Then, Similor is instantiated with it to be finetuned on the GraCe.

Scorer If the *vehicle* is unknown, we use the Scorer module to retrieve a vehicle and then add it to the input sequence. As shown in the right part of Figure 3, Scorer contains two steps to get figuratively meaningful while literally false pair of tenor-vehicle. Step 1 queries Cogbank dataset for the *tenor* "春天 (spring)" to obtain its top k most frequently used cognitive properties. These properties provide a basis for vehicle candidates selection and matching. The Cogbank dataset (83,017 items) contains more words than the glossary of common words in modern Chinese¹¹ (56,008 items), allowing fuller retrieval of vehicle candidates. In the implementation, the top 20 nouns with numbers of cognitive properties identical to tenor are chosen as candidates, which ensures a figuratively meaningful simile as the matched properties can be regarded as the ground. However, some literal-related words may also be selected in this step, e.g, "春风 (spring wind)". To obtain only figurative items, Step 2 reranks the Step 1 candidate based on the Euclidean distance of word embeddings between each item and tenor. Candidates with a longer distance are ranked higher, as they are less literally associated

with *tenor*. As a result, the " \blacksquare (painting)" is selected as the final *vehicle*. To be exact, given a *tenor* s_t , the *i*-th item w_i in Cogbank dataset get the ranking score $Score_{candi_i}$ by:

$$Score_{w_i} = \operatorname{Rank}(Fig_{w_i}) + \operatorname{Rank}(Lit_{w_i}),$$

$$Fig_{w_i} = \operatorname{Match}(w_i, s_t),$$

$$Lit_{w_i} = \operatorname{EucDist}(w_i, s_t).$$
(2)

Where $Rank(\cdot)$ denotes getting the ranking of the corresponding score. $Match(\cdot)$ means to count the numbers of shared cognitive properties between two items and $EucDist(\cdot)$ means the Euclidean distance between their word embedding. Notably, we use rankings to normalize these scores, avoiding the effects of different score scales.

5 Experiments

In this section, we first experimentally evaluate the quality of the GraCe dataset by applying it to prefixbased simile generation (§ 5.1). Since the setup of this uncontrollable generation task does not need additional annotations on the training samples, we can compare GraCe with previous Chinese simile datasets. Based on it, we then evaluate the proposed Similor on the new CSG task (§ 5.2). Specifically, we first compare different model varieties of Similor constrained by *comparator* and *vehicle*, and then evaluate the performances of Similor under more extensive constraints. Finally, we explore whether Scorer helps Similor to generate similes in the *vehicle*-unknown setup.

5.1 Experimental Analysis of GraCe

As statistical analysis is insufficient to evaluate GraCe, we evaluate it by prefix-based simile generation. One of the simple pipelines is to train a

¹¹http://www.moe.gov.cn/ewebeditor/uploadfile/ 2015/01/13/20150113085920115.pdf

Dataset	% Comp.↑	Simile Conf.↑	PPL↓			
Backbone: ChineseGPT2						
None	1.4	0.3	40.9			
CS (2021)	46.0	0.6	43.0			
CMC (2022)	44.4	0.7	30.9			
GraCe	93.5	0.9	10.9			
	Backbone: Chi	ineseBART				
CS (2021)	65.3	0.5	33.1			
CMC (2022)	56.7	0.8	33.3			
GraCe	85.3	0.9	28.7			

Table 5: The main results of prefix generation. "None" means using the backbone model to generate sentences without any continuing training, we ignore "None" of ChineseBART as it performs poorly in fluency. \uparrow means a higher score is better whereas \downarrow is exactly the opposite. Highest numbers are in **bold**.

Dataset	Fluen.↑	Creat.↑	Consi.↑	Overall ↑
CS	2.5	1.9	1.9	2.1
CMC	2.2	2.0	1.9	2.0
GraCe	3.0	3.2	3.2	2.8

Table 6: The human evaluation of prefix generation.

generator with the language modeling object on the simile dataset. In inference, this model is asked to generate a simile with a pre-specified *tenor*.

Baselines and Backbones. We compare the proposed GraCe with previous Chinese simile datasets: 1) **CS** (Zhang et al., 2021) contains 5.49M similes extracted from online fictions. 2) **CMC** (Li et al., 2022) contains 2.7k metaphors and similes from Chinese literature corpus. Besides, we utilize two representative Chinese pre-trained language models to avoid training from scratch: 1) **Chinese-BART**(CBART) (Shao et al., 2021): a BART_{Large} model pre-trained on 200GB text from Chinese Wikipedia and WuDaoCorpus. 2) **ChineseGPT2** (CGPT2) (Zhao et al., 2019): a GPT2_{Medium} model pre-trained on the CLUECorpusSmall dataset.

Experiment Setup. We employ the original hyper-parameter setting of $BART_{Large}$ and $GPT2_{Medium}$ to train all models, with a BERT tokenizer (Devlin et al., 2019) to process Chinese text. During inference, we use 25 common *tenors* as prefixes and ask models to continue writing with them (100 completions for each).¹²

Metrics. For automatic evaluation, we first use **Perplexity (PPL)** from CGPT2 to evaluate the text quality. As for simile evaluation, we compute

the proportion of sentences containing *comparator* words (% Comp.) to evaluate element-incomplete cases, because it's the hallmark of a simile. However, a sentence containing *comparator* words may not trigger a simile (Liu et al., 2018). Therefore, we use **Simile Conf.** to evaluate the figurative meaning of the generated results, i.e., element-mismatched cases. Specifically, we reuse the simile classifier in Step 2 of the dataset processing (See § 3.1) to compute the averaged confidence score of each method. Aside from it, we also conduct human evaluation following Chakrabarty et al. (2020). 250 samples are randomly selected from each generated result. Then, three crowdsource evaluators are asked to rate model results in four categories: 1) Fluency (Fluen.). Whether the sentence is fluent and grammatical; 2) Creativity. How well the sentence is figurately meaningful; 3) Consistency (Consi.). Whether the generated vehicle has shared properties with the pre-specified tenor. 4) Overall. How good is the simile overall? The score is based on how well-formed, creative, and consistent it is. Scores are ranged from 1 to 4, the higher is better.¹³

Results The prefix generation results are shown in Table 5 and human evaluation results are in Table 6. We find that: 1) Models finetuned with GraCe outperform other simile datasets in terms of text quality and simile creativity. 2) Generative language models tend to produce literal sentences over similes that highlight challenges of simile generation, as also mentioned in Chakrabarty et al. (2021b). Although Models could produce simile-like sentences through prefix generation, undesired results are also obtained (e.g., missing *compartor* and having incoherent *tenor-vehicle* pairs) without controlling simile elements.¹⁴ Thus, it is necessary to explore a new simile generation method.

5.2 Controllable Simile Generation

We first benchmark the CSG task with different model varieties constrained on pre-specified *comparator* and *vehicle*, then explore the performances of Similor under different combinations of constraints. Finally, we evaluate Similor with Scorer in the *vehicle*-unknown CSG setup. Specifically, given a *topic* containing a *tenor*, the *tenor-vehicle* pair retrieval method is asked to find an appropriate *vehicle* as the constraint, then hints Similor to

¹²See Appendix B.1 for the word list and inference setup

¹³Details about the score definition and inter-annotator agreement are in Appendix C.2.

¹⁴Generating Samples are shown in Table 13.

Methods	ROUGE-1/2/L↑	BLEU↑	BERTScore [↑]	ACC-V↑
CGPT2	20.7/4.2/18.3	0.3	60.6	16.4
CBART	21.3/10.9/20.9	1.7	55.9	71.1
CGPT2 _{FT}	22.2/7.6/20.2	3.0	56.8	19.2
CBART _{FT}	31.4/13.3/26.6	3.0	66.7	54.5
Similor _{CGPT2}	37.7/17.4/32.9	3.3	83.8	49.1
Similor _{CBART}	56.6/39.6/54.7	19.7	68.9	99.4
Similor _{CGPT2FT}	39.5/19.0/34.0	4.0	68.2	84.3
Similor _{CBART_{FT}}	57.3/40.5/55.3	19.9	69.1	99.0

Table 7: Results of different models that all be constrained with pre-specified vehicle and comparator.

Constraints	ROUGE-1/2/L	BLEU	BERTScore	ACC-V	ACC-C
None	29.5/10.4/27.1	4.2	63.4	17.9	38.5
Context	35.4/14.7/32.8	5.6	65.4	27.4	42.0
Comparator	43.0/23.6/41.5	10.0	66.2	30.0	95.9
Vehicle	51.9/30.6/47.6	14.0	68.4	99.0	47.2
Vehicle + Comparator	57.3/40.5/55.3	19.9	69.1	99.0	99.9
Vehicle + Comparator + Context	59.8/41.4/57.2	21.3	69.9	94.8	98.3

Table 8: Performances of different constraints and combinations under Similor_{CBART}. ACC-C: the accuracy of whether the *comparator* appears in the final output if it is not pre-specified.

generate the final simile.

Methods. As a new task of simile generation, we benchmark it with Similor and evaluate model variants as follows: 1) ChineseBART (CBART) and 2) ChineseGPT2 (CGPT2) as described in § 5.1. However, they take language modeling as the learning object and cannot directly adapt to the new task. Following He et al. (2022) use the manual prompt for simile probing, we use "以_为喻体, 写出比喻句: (means write a simile with _ as a vehicle:, '_' is the placeholder for pre-specified textitvehicle)" as the prompt. Then, it is concatenated with the given topic and comparator as the input while generating a simile, which is similar to the in-context learning (Brown et al., 2020). 3) Finetuned ChineseBART (CBART_{FT}) and 4) **Finetuned ChineseGPT2** (CGPT2_{FT}). We finetune CBART and CGPT2 on the collected 260k student compositions with the language modeling object, respectively. The goal of finetuning is to make the model adapt to the composition writing domain. 5) Similor. We first instantiate Similor with CBART and CGPT2, namely Smilor_{CBART} and Smilor_{CGPT2}, respectively. To evaluate the gain performances that continuing fine-tuning on the student compositions, Similor is also instantiated by CBART_{FT} and CGPT2_{FT}, namely Smilor_{CBART_{FT}} and Smilor_{CGPT2_{FT}}, respectively. All of the models are then finetuned by GraCe Dataset. After that, we evaluate Scorer variants and baseline as follows: 1) Literally False Matching (LFM). The second step of Scorer, aims at ranking the candidate by the word embedding Euclidean distance between the candidate and the *tenor*. 2) ANT (Chen et al., 2022): A pre-training stage for $BERT_{Large}$ that only masks the noun or adjective in amod dependencies. Following Li et al. (2022), we translate the concatenated *comparator* and *topic* into English by Google translation and feed it to ANT to generate a *vehicle*.

Experiment Setup. We randomly split the GraCe dataset into 2000 test samples, and 2000 validation samples, and the rest are used for training. The training parameters setup for all models is as same as § 5.1. In inference, the beam size and length penalty (Wu et al., 2016) are set to 4 and 1.2, respectively. As for evaluating Scorer, we remain top 20 candidates for Step 1, finally returning the top one *vehicle* for generating the simile. For a fair comparison, all retrieval methods use Simlor_{CBART_{FT} to generate final results.}

Metrics. Following Chakrabarty et al. (2020); Zhang et al. (2021); Li et al. (2022), we evaluate results on **BERTScore** (Zhang et al., 2020), four-gram **BLEU** (Papineni et al., 2002), **ROUGE-**1/2/L (Lin, 2004). Besides, if the *vehicle* or *comparator* is pre-specified as the constraint, we use **ACC-V** or **ACC-C** to evaluate the accuracy of the offered *vehicle* or *comparator* appears in outputs. As a novel setup in CSG, *vehicle*-unknown CSG aims to find a figuratively meaningful yet literally

Methods	Automantic Evaluation				Human Evaluation			
	Simile Conf.↑	Literal Simi.↓	PPL↓	% V↑	Fluen.↑	Creat.↑	Consi.↑	Overall ↑
ANT	0.6	0.003	25.0	42.7%	1.9	1.7	1.6	1.7
LFM	0.8	-0.020	28.1	100.0%	2.7	2.3	2.3	2.3
Scorer	0.8	0.240	12.8	100.0%	3.1	2.5	3.0	2.6

Table 9: The main results of generating similes with different *tensor-vehicle* pairs retrieval method. %V represents the proportion of the samples that its vehicle is retrieved in the total number of test samples.

Automatic	luation S	cores		
Metrics	Fluen.	Overall		
Simile Conf. %Comp. PPL	0.312 0.286 0.388	0.634 0.329 0.311	0.603 0.324 0.321	0.540 0.351 0.377

Table 10: Pearson correlation between automatic metrics and human evaluation scores (p-value < 0.01).

false (Goodman, 1979) *tenor-vehicle* pair that has shared attributes to form the *ground*. Thus for evaluating Scorer, we first use **Simile Conf.** and **Perplexity** (PPL) mentioned in § 5.1 to evaluate the figurative meaning and text quality of the outputs, respectively. Following Shutova et al. (2016); Yu and Wan (2019), literally false factor is computed by **Literal Simi.**, which denotes the average cosine similarity of the given *tenor* and the retrieval *vehicle*, the lower the better. We use the Simlor_{CBARTFT} to compute the word embeddings. Besides, we conduct the human evaluation described in § 5.1.

Results. Comparations of different model varieties are shown in Table 7. We find that: 1) Both CSG task and models benefit from the pre-training stage, especially for the BART-based backbone. 2) Both Similor_{CBART} and Similor_{CGPT2} can generate similes that correctly incorporate constraints in outputs, with higher text quality than baselines. Besides, performances of Similor with different constraints are in Table 8, which indicates: 3) Introducing more simile constraints helps Similor to generate desired similes. Especially context, Similor could generate similes only being hinted by context (BERTScore 63.4 to 65.4). Finally, As shown in Table 9, Scorer beats model-based retrieval method both in figuratively meaningful and text quality, guaranteeing to provide vehicle for each testing tenor. As for literal similarity, LFM gets the highest score yet surfers from the lowest text quality, indicating that there is a trade-off between figuratively meaningful and literally false factors when generating similes.

5.3 Further Discussions

As a new task in simile generation, the evaluation method of it is absolutely important. Thus we compute the system-level Pearson correlation between automatic scores and human judgments of generated similes. In Table 10, Simile Conf. shows a strong correlation with human scores in terms of Creativity and Consistency, indicating that it could be an effective method to evaluate the figurative meaning of similes. In contrast, % Comp. shows a poor correlation with that two scores, which demonstrates the limitations of only considering the comparator when judging a simile. Meanwhile, PPL shows a higher correlation than the other two metrics in evaluating fluency, yet having a remarkable gap with the human score. To furtherly explore the concerns of human when evaluating a simile, we also compute the internal correlation of human scores. As shown in Appendix Table 11, there is a strong correlation between Creativity and Consistency. It means that having ground is also important in generating a creative simile, illustrating the necessity of interpretably retrieving tenor-vehivle pair in the vehicle-unknown setup.

6 Conclusion

In this paper, we introduce a new task setup for simile generation: controllable simile generation (CSG). To facilitate it, we build GraCe, a finegrained annotated Chinese simile dataset, and benchmark this task with the proposed CSG model Similor, which includes a *vehicle*-retrieval module Scorer. Our work takes the first attempt to expand the elements of simile from the aspect of Cognitive Linguistics (Kövecses, 2010) (i.e, *ground* and *context*), and tentatively gives a successful implementation of probing simile interpretation from the cognitive property. We hope this idea can provide novel insights to future works of the creative generation, such as puns, hyperbole, and poetry, etc.

Limitations

In this paper, we explore incorporating multiple constraints to simile generation and attempt to interpret the simile comparisons from the aspect of Cognitive Linguistics. However, the creativity of simile is one kind of subjective feeling and is difficult to be accurately judged, which is also a big challenge for other kinds of creative writing tasks. We hope this task and dataset could provide novel insight into user-oriented text generation, and give the interactive and collaborative generation a closer and more detailed exploration.

Ethics Statement

We hereby acknowledge that all of the co-authors of this work are aware of the provided *ACL Code of Ethics* and honor the code of conduct. We elaborate ethical considerations to the community as follows:

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors. Informed consent was obtained from all individual participants included in the study. Specifically, we conduct all of the human evaluations via full-time Chinese employees from the Chinese data annotation platform, ensuring all of the personal information of the workers involved (e.g., usernames, emails, URLs, demographic information, etc.) is discarded. Meanwhile, we ensure the pay per sample is above the annotator's local minimum wage (approximately \$0.7 USD / sample).

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The Annotated Simile

Context 深秋时节,枝头黄 In late autumn, the y by the autumn wind o 好像一只只蝴蝶,	t Above 一 叶被一夜秋风吹尽 ellow leaves on the b vernight. The leaves f 在空中翩翩飞舞。	Tenor Tenor · 叶子从树上飘下来, ranches were blown away loated down from the trees 秋风扫落叶名不虚传。
│ └─ Vehicle ─ Comparator	Ground —	Context Blow
like butterflies, flutte leaves worthy of the n Cognitive	ring in the air. The ame.	autumn wind sweeps the
叶子 (the leaves) 飞 (flying) 飘落 (falling) 落 (falling)	Shared Property	蝴蝶 (butterflies) 飞 (flying) 飞舞 (fluttering) 美丽 (beautiful)
长 (growing)		自由 (free)

Figure 4: An example to explain the annotated eight elements of a simile in our GraCe dataset. Translations are provided for non-Chinese speakers.

A Details of Dataset Building

As shown in Figure 4, we expand three commonly annotated elements (i.e., *tenor*, *vehicle* and *comparator*) (Li et al., 2022) to eight, including the *context* element to put each simile into a more naturally-using situation.

A.1 Simile Classification

The simile classifier aims at filtering those nosimile samples containing comparator words. These sentences can be roughly divided into three types: 1) personified sentence, e.g., "大树好像在 向我们招手。 (The tree seems to be waving to us.)" contains comparator word "好像 (seems to)". 2) hyperbole sentence, e.g., "这教室静得仿佛掉 一根针都能听见。 (The classroom was so silent like you could hear a pin drop.)" contains comparator word "仿佛 (like)". 3) literal sentence, e.g., "他 似乎从来没有来过这里。 (He never seems to be here.)" contains comparator word "似乎 (seems to)". However, the previous dataset (Li et al., 2022) only offers the literal sentence that does not contains comparator words as the negative samples for the simile classifier, which may not satisfy our settings.

To this end, we collect a new dataset to include negative samples about these three types of nosimile sentences. Specifically, we collect personified sentences¹⁵ and hyperbole sentences¹⁶ from websites and only keep sentences that contains *comparator* words. As for type three, we ask three annotators to annotate randomly selected 3000 samples from Step 1 candidates. A sentence is selected as the negative sample if all of them regard it as a literal sentence. As for the positive samples, we also collect similes from the website of composition teaching ¹⁷ to ensure their styles are similar to our candidates. Finally, we get the new simile classification dataset and randomly split it into: training set 5905 samples (positive:2913 negative: 2992) / validation set 200 samples (positive:100 negative:100) / testing set 200 (positive:100 negative:100).

Based on this new dataset, we finetune a Chinese RoBERTa_{Large} model to classify the Step 1 candidates. For training this model, the learning rate is set to 5e-5 and the warm-up step is set to 200. The f1 score on the validation set and testing set are 0.85 and 0.82, respectively.

A.2 Simile Detection

Simile Detection aims at labeling out the *tenor* and *vehicle* of a simile, that is, forming it as a sequence labeling task. In implantation, we use the most relevant dataset CCL2018 (2018) to train the sequence labeling model. The CCL2018 dataset contains 6554 training samples, 2038 testing samples, and 1650 validation samples. Based on this dataset, we finetune a Chinese RoBERTa_{Large} model to label each sample in GraCe. For training this model, the learning rate is set to 5e-5 and the warm-up step is set to 200. The Accuracy scores on the validation set and testing set are 98.47% and 98.38%, respectively.

However, all samples only contain one kind of comparator words (i.e., "像 (like)"), the trained model cannot be directly applied to GraCe that contains various comparator words and their corresponding patterns. To solve this problem, in the inference stage, we first locate and replace each comparator pattern with the pattern containing the comparator word "像 (like)", as they have the same meaning in different words (all means like). After

https://www.t262.com/juzi/nirenju/,

https://wenku.baidu.com/view/

¹⁵personified sentences:

a70e349cbbf3f90f76c66137ee06eff9aef84906.html ¹⁶hyperbole sentences:https://www.chazidian.com/ zaoju_5/

¹⁷https://www.yuwenmi.com/yuwenjichu/biyuju/

Algorithm 1 Fuzzy Matching

Require: C: the Cogbank dictionary with nouns as keys and the associated cognitive attributes as their values **Require:** *t*: the tokenized word sequence needed to be queried with the length of l, t= $\{t_1, t_2, ..., t_l\}$ **Require:** w: the width of the sliding window. w = lwhile w > 0 do if w = l and $t \in C$ then return t else i = 1while i < l + 1 do $word = \{t_i, ..., t_{i+w}\}$ if $word \in C$ then return word else i = i + 1end if end while end if w = w - 1end while

return None Words Mapping

that, we use this new sample as model input to get corresponding *tenor* and *vehicle*.

A.3 Fuzzy Matching for Cogbank Dataset

The fuzzy matching algorithm is shown in algorithm 1.

A.4 Simile Samples

We show some annotated samples of GraCe in Table 12.

B Details of Experiments

B.1 Simile Genearting Prefix

We consider 25 commonly used *tenors* as sentence starters for evaluating different datasets in the Experiment for prefix generation. The entire set is blow (Translations are provided for non-Chinese speakers.):

"爱 (love)", "时间 (time)", "叶子 (leaves)", "太阳 (sun)", "树叶 (leaves)", "童年 (childhood)", "笑容 (smile)", "落叶 (fallen leaves)", "眼泪 (tears)", "阳光 (sunshine)", "泪水 (tears)", "时光 (time)", "柿子 (persimmon)", "生命 (life)",



Figure 5: The top 20 most frequent comparator templates in the GraCe, all means "like". "_" denotes the placeholder that can be filled with tenor-related (the first) and vehicle-related (the second) content.

"记忆 (memory)", "花瓣 (petals)", "天空 (sky)", "目光 (gaze)", "雪花 (snowflakes)", "苹果 (apple)", "青春 (youth)", "枫叶 (maple leaves)", "友 谊 (friendship)", "微笑 (smile)", "幸福 (happiness)".

In inference, we use top-k sampling with k=10 and fix the random seed as 42 for all models to get the final results, while the maximum generation length is set to 100.

B.2 Generating Samples of Prefix Generation

To intuitively display the effects of datasets, we show some generating results in Table 13.

B.3 Generating Samples of Controllable Simile Generation

Some generating results of Similor with different constraints are shown in Table 14 and we also sample the results of Similor with different *vehicle* retrieval methods as shown in Table 15.

C Details of Human Evaluation

C.1 Human Evaluation for Datasets Comparasions

In order to compare the GraCe dataset with other relevant datasets, 1000 samples are randomly selected from each dataset. At the same time, three professional annotators are invited to label these data samples. Notably, the mother tongue of all annotators is Chinese. The only difference between professional annotators and crowdsourcing annotators is that professional annotators major in Chinese language and literature while crowdsourcing annotators only require majors related to Chinese literature. Because the studied courses include Chinese grammar and rhetoric, professional annotators have the ability to verify that the fine-grained annotations in our dataset are correct.

Before the formal progress, we first set a guideline for evaluating, which includes the task background, key points, detailed descriptions, and examples of different patterns of similes. Then, we set an entry barrier for annotators. In detail, we organize a training program and a preliminary annotating examination (20 examples for each dataset) to select appropriate annotators with an approval rate higher than 95%.

Score Definition we first ask annotators to determine whether a given sample is a simile (1 means the given sample is a simile, and 0 is the opposite). Notably, as the CMC dataset (Li et al., 2022) also contains metaphors, annotators are asked to regard that cases as another kind of simile and label them with 1. Aside from it, we furtherly check the finegrained annotated elements of samples from the GraCe dataset. In detail, annotators are also asked to determine whether the annotated elements of these samples are correct (1 means yes, and 0 is the opposite), including *tenor*, *vehicle*, *comparator*, and *ground*.

Inter-annotator agreement We use Fleiss' kappa (Fleiss, 1971) to measure three annotator's reliability¹⁸. The results are: 1) For CS dataset: 0.72 (substantial); 2) For CMC dataset: 0.62 (substantial); 3) For GraCe dataset:0.78 (substantial).

C.2 Details of Human Evaluation

For human evaluation, we first set a guideline for evaluating, which includes the task background, key points, detailed descriptions, and examples of evaluation scores from 1 to 4. Then, we set an entry barrier for annotators. In detail, we organize a training program and a preliminary annotating examination (50 examples for each model) to select appropriate annotators with an approval rate higher than 95%.

Score Definition We define four categories in the human evaluation as follows:

- 1. **Fulency** (Fluen.) means whether the sentence corresponding to the option is fluent, grammatical, well-formed, and easy to understand.
- 2. **Creativity** (Creat.) means whether the sentence corresponding to the option is creative

and figuratively meaningful.

- 3. **Consistency** (Consi.) means whether the sentence corresponding to the option contains a meaningful *tenor-vehicle* pair. A meaningful pair denotes there are some share properties between the *tenor* and the *vehicle*, i.e., having the explicit/implicit ground.
- 4. Overall means how good is the sentence corresponding to the option overall? The annotators are asked to score the generating results based on how well-formed, creative, and consistent it is.

Inter-annotator agreement We use Fleiss' kappa (Fleiss, 1971) to measure three annotator's reliability¹⁹. The results are: 1) For Experiment Q1: 0.43 (moderate) 2) For Experiment Q2: 0.30 (moderate).

C.3 Correlation Analyze

	Fluen.	Creat.	Consi.	Overall
Fluen.	-	0.477	0.482	0.729
Creat.	0.477	-	0.970	0.841
Consi.	0.482	0.970	-	0.843
Overall	0.729	0.841	0.843	-

Table 11: Pearson correlation between different human evaluation scores (p-value < 0.01).

¹⁸https://www.nltk.org/_modules/nltk/metrics/ agreement.html

¹⁹https://www.nltk.org/_modules/nltk/metrics/ agreement.html



Figure 6: The interface for scoring Fluency.

Topic	Comparator	Ter	or	Vehi	icle	Ground		Context	
	I	Word	Property	Word	Property		Above	Below	
Sample 1: 远看,层林尽染。近看,那深红、浅红、金黄的枫叶,像一只只小手掌在风中摇曳着,似乎在欢迎着 我们的到来。片片美丽的叶子像蝴蝶一样飘飞,脚底有树叶轻轻的碎响,秋那厚重的美就久久盘旋心头。 Sample 1: From a distance, the layers of trees are dyed in color. Looking up close, the dark red, light red and golden maple leaves, like small palms swaying in the wind, seem to welcome us. Pieces of beautiful leaves fluttered like butterflies, and the soles of my feet were softly cracking, and the heavy beauty of autumn was circling in my heart for a long time. 片片美像一样,叶子飞,蝴蝶飞,飘飞远看…似脚底盘									
丽 的 叶 子			飘落, 落…		飞舞, 美丽		乎 在 欢 迎 着 我 们 的 到来。	旋心头。	
pieces of beautiful leaves	like	leaves	flying, falling, falling	butterflies	flying, fluttering, beautiful	fluttered	From a dis- tanceseem to welcome us.	and the soleswas circling in my heart for a long time.	
Sample 2: 苹果绽开 Sample 2:	当秋姑娘来到 了笑脸,好像在 When the autum	了硕果累累 E说: "秋如 in girl came	累的果园时 b娘来了, e to the frui	。那一串目 我们又苏酷 tful orchard	B紫色的葡 了。" A bunch c	萄就像一颗 of purple gra	颠颗紫色的珍珠 apes like a purp	朱,真美丽啊!粉红的 le pearl, really beautiful!	
Pink apple	blooming smile	, as if to sa 毒毒	y: "Autumi ⊸⊬∃∃	n girl came,	we woke u	p again."	业 用 同		
那一 中 串 紫 色 的葡萄	_机1家_,	间田	小灭灭, 亮晶晶, 晶莹…	少坏	盾殖生件 晶莹, 细腻…	,儿	∃来 四 时。	兵…义 が 醒了。"	
a bunch of purple grapes	like	grapes	watery, glitter, crystal	pearl	shining, crystal, exquisite.	None 	When orchard.	reallywoke up again."	
Sample 3: 透过晶莹的泪珠,我看到了暖洋洋的太阳。爸爸妈妈的爱不就像太阳一样温暖着我吗?那一刻,已成为我人生中最重要的时刻,时时牵动着我的心 Sample 3: Through the crystal tears, I saw the warm sun. Isn't mom and dad's love warm me like the sun? That moment has									
爸爸妈 ^妈 的爱	像_一	t moment n 爱	n my me, a 热烈,	太阳	ing my nea 温暖, 业明	III 温暖着 ^{我吗?}	透过太	那 一	
妈时友	1+ like	love	^{祖,} 温暖…	cun	元明, 火红	我吗!	만니 ·	That mo	
dad's love	like	love	sweet, warm	Sun	light, fiery	me	Throughsun	mentheart	
Sample 4: 团团棉花。 耀下,变得 Sample 4:	到了云锦山庄 。明净的湖面上 导波光粼粼,真 To the Yuniin V	,我们被盯 隐隐约约 是美丽啊 illa we we	艮前的景色 可以看到重 ! re fascinate	迷住了,仿 插天白云的作 cd by the sce	方佛走进了 到影,微风 enery, as if	仙境。朵ź 【吹过,湖 in a fairyla	除白云漂浮在 面上泛起了小→ nd. White cloue	鲁蓝的天空中,好像一 小的波纹,在阳光的照 Is floated in the blue sky	
like clumps and there a	s of cotton. The re small ripples	reflection of on the lake	f the blue sl . Under the	ky and white sunshine, i	clouds car t becomes	i be seen fai sparkling, i	intly on the clea t is really beaut	r lake. The breeze blows, iful!	
朵 宗	好像_。	白云	柔软, 洁白, 轻盈	棉花	柔软, 轻盈, 蓬松	无	到 了仙 境	明净的湖 面美丽 啊!	
white clouds floated in the blue sky,	like	white clouds	soft, white, light	cotton	soft, light, fluffy	None	Tofairyland	The reflec- tion of beautiful!	

Table 12: The annotated samples from the GraCe dataset. For each sample, we first give the full text and then give all the annotated information. " π (None)" denotes the *ground* is implicit in the simile. Due to space constraints, we have omitted some contents of the property and context. Translations are provided for non-Chinese speakers.

Prefix 1: 时间 (time)							
CS	时间果然很是短暂,不等他做出什么反应时就已经过去了。(The time was really short, and it passed						
	before he could react.) X						
CMC	时间是像一条彩带系在心中。(Time is like a ribbon in the heart.) ✓						
GraCe	时间,如同奔腾的江河,在我面前悄然逝去。(Time, like a pentium river, quietly flows away in front of						
	me.) 🗸						
Prefix 2: 叶子 (Leaves)							
CS	叶子何时变得这么小,简直就像是一个孩子一般。我的心也被这个情景吓到了。(When did the leaf						
	become so small, it was like a child. My heart was also frightened by this scene.) 🗡						
CMC	叶子像,就像那空中飞舞的蝴蝶一样,扇动着薄翼,初降人间。(The leaves are like, just like the						
	butterflies in the air, flapping their thin wings and falling to the world.) \checkmark						
GraCe	叶子,长得又细又尖,像一把锋利的宝剑。(The leaves grow thin and pointed, like a sharp sword) ✓						
Prefix 3:	Prefix 3: 太阳 (Sun)						
CS	太阳点点亮,天边的云层被晒得滚红,就像是要下雨了似的。(The sun lit up, and the clouds on the						
	horizon were reddened, as if it were going to rain.) 🗡						
CMC	太阳就是春天的一缕阳光, 拂去冬日炎热和干燥。(The sun is a ray of spring sunshine, brushing away the						
	heat and dryness of winter.) X						
GraCe	太阳火辣辣的照着大地,就像一个巨大的火球在燃烧。(The sun blazed down on the earth like a huge						
	fireball burning.) 🗸						
Prefix 4:	记忆 (Memory)						
CS	记忆果然如同传说中一样美丽迷人。(The memory is as beautiful and charming as the legend.) 🗡						
CMC	记忆,就像那些仙天上的星斗一样美丽。(Memories are as beautiful as the stars in the fairy sky.) ✓						
GraCe	记忆,是一个五味瓶,酸甜苦辣样样俱全,如同过山车般满载喜怒哀乐。(Memory is a tasting bottle,						
	sour, sweet, bitter, and spicy everything, like a roller coaster full of joys and sorrows.) \checkmark						
Prefix 5: 雪花 (Snowflake)							
CS	雪花着何其美丽,雪花就好像是精灵一样,一点一点融化在天空中。(How beautiful snowflakes are,						
	snowflakes are like fairies, melting in the sky bit by bit.) \checkmark						
CMC	雪花,在空中飘动,就像一个个银色的精灵。(snowflakes, fluttering in the air, like a silver spirit.) 🗸						
GraCe	雪花,飘落的时候就像一只美丽的仙鹤在空中翩翩起舞。(The snowflake falls like a beautiful crane						
	dancing in the air.) \checkmark						

Table 13: Samples of prefix generation with different datasets. \checkmark indicates the corresponding sentence is a simile, while \varkappa means it is not a simile. Translations are provided for non-Chinese speakers.

Topic:他唱得并不好听,声音 (He did not sing well, and his voice,) Reference:他唱得并不好听,声音像砂纸打磨着耳朵。(He didn't sing very well, and his voice was like sandpaper sanding against the ears.) Constraint: None 他唱得并不好听,声音是如雷鸣般的响声。(He did not sing well, and his voice was like thunder.) Constraint: Context: 可他是那样地认真,那样地投入,仿佛在大舞台上唱歌,台下有千万个观众聆听 着。(But he was so earnest, so devoted, as if he were singing on a big stage with millions of people listening.) 他唱得并不好听,声音像一把利剑,深深地插进了我的胸膛。(He did not sing well, and his voice, like a sword, cut deep into my chest.) **Constraint:** Comparator: 像...。(like...a full stop) 他唱得并不好听,声音像蚊子在叫,又像苍蝇在乱飞。(He did not sing very well, and his voice was like the cry of a mosquito, or like a fly.) Constraint: Vehicle: 砂纸 (like...a full stop) 他唱得并不好听,声音,就像砂纸一样沙哑。(He did not sing very well, and his voice was like the cry of a mosquito, or like a fly.) **Constraint:** Context+Comparator+Vehicle 他唱得并不好听,声音,像一块干燥的砂纸在微微地颤抖。(He did not sing very well, his voice, like a piece of dry sandpaper in a slight tremor.)

Table 14: Samples of Similor under different constraints and combinations. Translations are provided for non-Chinese speakers.

Sample 1:							
ANT	风,缓缓吹过,槐花树上的槐花便落下,洁白的 花瓣 如 英亩 一般,在空中飞舞。(The wind, slowly blowing, flowers on the sophora tree fell down, white petals like acres, flying in the air.)						
Literal False	风,缓缓吹过,槐花树上的槐花便落下,洁白的 <mark>花瓣</mark> ,如白色的 <mark>百合</mark> 一般,美丽极						
	$\vec{J} \circ$ (The wind, slowly blowing, flowers on the sophora tree fell down, white petals like white lilies,						
	Shared properties between <i>tenor</i> and <i>vehicle</i> : 美丽 (beautiful), 绽放 (blooming), 盛开 (full-blown), 枯萎 (withered), 美好 (good)						
Scorer	风,缓缓吹过,槐花树上的槐花便落下,洁白的花瓣,如羽毛一般,轻轻地飞下来。(Th wind, slowly blowing, flowers on the sophora tree fell down, white petals like feathers, gently fly down						
	Shared properties between <i>tenor</i> and <i>vehicle</i> : 散洛 (scattered), 柔软 (soft), 美丽 (beautiful), 轻盈 (lithesome), 飘 (fluttering)						
Sample 2:							
ANT	然后在杯中倒入开水, 胖大海 立马就浮起来了, 还像离开水的 小白兔 一样。(Then we pour boiling water into the cup, the sterculia scaphigera floats up immediately like a white rabbit out of water.)						
Literal False	然后在杯中倒入开水, 胖大海 立马就浮起来了, 我还像一只 小刺猬 一样蜷缩着。(Then we pour boiling water into the cup, the sterculia scaphigera floats up immediately and I curl up like a little hedgehog.)						
	Shared properties between <i>tenor</i> and <i>vehicle</i> : 膨胀 (intumescent)						
Scorer	然后在杯中倒入开水, 胖大海 立马就浮起来了, 还像 面包 一样膨胀起来。(Then we pour boiling water into the cup, the sterculia scaphigera floats up immediately, and expands like bread.)						
	Shared properties between <i>tenor</i> and <i>venicle</i> : 膨麻 (intumescent), 发升 (rasing)						
Sample 3: ANT	None						
Literal False	老人微眯双眼,眺望着天空中的风筝, 眼神祥和宁静, 如 杰克 般飞翔(The old man squinted his eyes and looked at the kite in the sky. His eyes were peaceful and quiet, flying like Jack)						
	Shared properties between <i>tenor</i> and <i>vehicle</i> : "九角 (melancholy)						
Scorer	老人微眯双眼,眺望着大空中的风筝, 眼神 祥和宁静, 如 晨露 殷滋润着我的心田。(The old man squinted his eyes and looked at the kite in the sky. His eyes were peaceful and quiet, which moistened my heart like morning dew.)						
	Shared properties between tenor and vehicle: 干净 (fresh), 清澈 (limpid)						
Sample 4: ANT	None						
Literal False	望着一个个设施,一幅幅画面,从我们的眼前闪过,回忆,像蜡人似的,一个个地浮现在我们眼前。(Looking at the facilities one by one, a picture flashed from our eyes, memories, like wax dolls, one by one emerged in front of our eyes.)						
	Shared properties between <i>tenor</i> and <i>vehicle</i> : 不真实 (unreal)						
Scorer	望着一个个设施,一幅幅画面,从我们的眼前闪过,回忆,像春花。似的,开满了我们的心田。(Looking at the facilities one by one, a picture flashed from our eyes, memories, like spring flowers,						
	open full of our hearts of the field.)						
	Shared properties between tenor and vehicle: 温暖 (warm), 绚烂 (splendid)						
Sample 5: ANT	None						
Literal False	站 在 黑 板 前 , 我 忽 然 有 种 恍 然 隔 世 的 感 觉 , 尘 封 已 久 的 <mark>记忆</mark> 如 一 片 平 静						
	的 太平洋。 (Standing in front of the blackboard, I suddenly feel as if a generation has passed, dusty memories are like the calm Pacific Ocean.)						
	Shared properties between tenor and vehicle: 深 (deep), 美丽 (beautiful)						
Scorer	站在黑板前,我忽然有种恍然隔世的感觉,尘封已久的 <mark>记忆</mark> 如一片 <mark>大海</mark> ,宽阔而又神						
	秘 \circ (Standing in front of the blackboard, I suddenly feel as if a generation has passed, dusty memories are like a sea, wide and mysterious.)						
	Shared properties between tenor and vehicle: 深 (deep), 美丽 (beautiful), 悠久 (long-standing)						

Table 15: Samples of Similor with different *vehicle* retrieval methods. "None" means no valid *vehicle* has been retrieved and we highlight the *tensor* - *vehicle* pair for better view.Translations are provided for non-Chinese speakers.

ACL 2023 Responsible NLP Checklist

A For every submission:

- ✓ A1. Did you describe the limitations of your work? See Limitations section (page nine).
- □ A2. Did you discuss any potential risks of your work? *Not applicable. Left blank.*
- ✓ A3. Do the abstract and introduction summarize the paper's main claims? See the Abstract and Section 1.
- A4. Have you used AI writing assistants when working on this paper? *Left blank.*

B Did you use or create scientific artifacts?

Not applicable. Left blank.

- □ B1. Did you cite the creators of artifacts you used? *Not applicable. Left blank.*
- □ B2. Did you discuss the license or terms for use and / or distribution of any artifacts? *Not applicable. Left blank.*
- □ B3. Did you discuss if your use of existing artifact(s) was consistent with their intended use, provided that it was specified? For the artifacts you create, do you specify intended use and whether that is compatible with the original access conditions (in particular, derivatives of data accessed for research purposes should not be used outside of research contexts)? *Not applicable. Left blank.*
- □ B4. Did you discuss the steps taken to check whether the data that was collected / used contains any information that names or uniquely identifies individual people or offensive content, and the steps taken to protect / anonymize it? *Not applicable. Left blank.*
- B5. Did you provide documentation of the artifacts, e.g., coverage of domains, languages, and linguistic phenomena, demographic groups represented, etc.?
 Not applicable. Left blank.
- □ B6. Did you report relevant statistics like the number of examples, details of train / test / dev splits, etc. for the data that you used / created? Even for commonly-used benchmark datasets, include the number of examples in train / validation / test splits, as these provide necessary context for a reader to understand experimental results. For example, small differences in accuracy on large test sets may be significant, while on small test sets they may not be. *Not applicable. Left blank.*

C ☑ Did you run computational experiments?

See Section 5

 C1. Did you report the number of parameters in the models used, the total computational budget (e.g., GPU hours), and computing infrastructure used?
 See Section 5

The Responsible NLP Checklist used at ACL 2023 is adopted from NAACL 2022, with the addition of a question on AI writing assistance.

- ✓ C2. Did you discuss the experimental setup, including hyperparameter search and best-found hyperparameter values? See Appendix
- C3. Did you report descriptive statistics about your results (e.g., error bars around results, summary statistics from sets of experiments), and is it transparent whether you are reporting the max, mean, etc. or just a single run? *See Section 5*
- C4. If you used existing packages (e.g., for preprocessing, for normalization, or for evaluation), did you report the implementation, model, and parameter settings used (e.g., NLTK, Spacy, ROUGE, etc.)?
 See Sections 3 and 5
- **D D id you use human annotators (e.g., crowdworkers) or research with human participants?** See Section 5
 - ✓ D1. Did you report the full text of instructions given to participants, including e.g., screenshots, disclaimers of any risks to participants or annotators, etc.?
 See Appendix
 - ✓ D2. Did you report information about how you recruited (e.g., crowdsourcing platform, students) and paid participants, and discuss if such payment is adequate given the participants' demographic (e.g., country of residence)?
 See Appendix and Ethics Statement
 - □ D3. Did you discuss whether and how consent was obtained from people whose data you're using/curating? For example, if you collected data via crowdsourcing, did your instructions to crowdworkers explain how the data would be used?
 Not applicable. Left blank.
 - ☑ D4. Was the data collection protocol approved (or determined exempt) by an ethics review board? *See Ethics Statement*
 - D5. Did you report the basic demographic and geographic characteristics of the annotator population that is the source of the data?
 Not applicable. Left blank.