

## Formalization and Rules for Recognition of Satirical Irony

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**Abstract**—Satirical irony("反讽") is a very important language phenomena. Its recognition is of great importance to sentiment analysis. However, researches on this topic are still quite rare and existing studies have problems such as unclear definition and unclear objects of study. To solve these problems, we first give clear definitions of satirical irony. Then we discuss in what level satirical irony occurs. Finally, we propose some features of satirical irony.

**Irony Satire Formalization(key words)**

### I. INTRODUCTION

Irony ("反语") and satire ("讽刺") are very important phenomena in languages. They become more and more popular with the development of twitter, blog, and bbs (Bulletin Board System). From people forum<sup>1</sup>, we sampled 2479 sentences, each of which has more positive words than negative words, and found that 259 sentences relate to either satire or irony<sup>2</sup>.

Satirical irony ("反讽") is critical for opinion mining system and commodity recommendation system. If they are not identified, the analysis result may be wrong. For example, for the following sentence, the result "The officials in Taiwan -> positive" will be got if the satirical irony is not identified. The correct result should be "The officials in Taiwan -> negative".

台湾官员真是聪明啊，塑化剂吃了 30 年才查出来。(The officials in Taiwan are really smart. They ate industrial plasticizer for 30 years before it was found out.)

Very little work has been done on irony or satire. Problems such as unclear definition and unclear objects of study occur in the current existing researches. Besides, misconceptions between the definitions of irony and satire, irony and satirical irony("反讽") are not rare. Although we use the word "反讽" (satirical irony) often, we find no definition of this word in 1965 年版《辞海》(CiHan, the 1965 version), 1988 版《辞源》(Ciyuan, the 1988 version), 《现代汉语词典》(The Dictionary of Modern Chinese) and 《现代汉语规范词典》(Standard Dictionary of Modern Chinese).

<sup>1</sup> <http://bbs.people.com.cn/>

<sup>2</sup> We choose sentences have more positive words because satirical irony is mainly in these sentences which are literally a positive sentence.

To solve these problems, we first give clear definitions of irony, satire and satirical irony. Then we discuss in what level satirical irony occurs. Finally, we propose some features (including features which can be well formalized and features which can not be well formalized now) of satirical irony -- the main cause of the incorrectness in the analysis results.

### II. TERMS

In this section, we will present some related terms and their explanation below.

**Antiphrasis:** *the usually ironic or humorous use of words in senses opposite to the generally accepted meanings. (as in "this giant of 3 feet 4 inches")*[Merriam-Webster's 11th Collegiate Dictionary]

**Irony:** *I) the use of words to express something other than and especially the opposite of the literal meaning. II) b : a usually humorous or sardonic literary style or form characterized by irony.*[Merriam-Webster's 11th Collegiate Dictionary]

**Verbal Irony:** *a figure of speech in which what is said is the opposite of what is meant. [Dictionary.com's 21st Century Lexicon]*

**Satire:** *I) Trenchant wit, irony, or sarcasm used to expose and discredit vice or folly. [Merriam-Webster's 11th Collegiate Dictionary]*

**讽刺 (fěng cì) (Satire):** *I) 用比喻、夸张、反语等表达手法进行披露、批评、或嘲弄。[现代汉语规范词典] (To expose, critic or ridicule, using metaphor, hyperbole or irony or other ways of expression.) II) 用比喻、夸张等手法对不良的或愚蠢的行为进行揭露或批评。[现代汉语词典(The Dictionary of Modern Chinese)] (To expose or critic vice or folly using metaphor or hyperbole or other ways of expression.)*

**反语 (fǎn yǔ) (Irony):** *I) 修辞方式之一，用辞与真正的意思相反，多含有嘲弄讽刺的意味。[辞源 1988 年版(Ciyuan, the 1988 version)] (A figures of Speech which using words opposite to its real meaning. Usually used in mock and satire.) II) 反话，故意说的跟本意相反的话。[现代汉语规范词典(Standard Dictionary of Modern Chinese)] (A statement in which the speaker says intentionally what is opposite to the meaning he wants to express.)*

### III. RELATED WORKS

[1][3] proposed a unified theory of irony which emphasizes the of irony environment. However, it is

hard to formalize the irony environment in real applications because the expectation, which is the core of irony environment, must be realized based on semantic meaning. [5][7] proposed a semi-supervised method to recognize sarcastic sentences from online product reviews. But consider only simple sentence pattern and punctuation information without any lexical information which is of highly importance to the recognition of satire according to [6]. Moreover, they have a misconception between the definitions of verbal irony and sarcasm. [8] experiments with SVMs, feature scaling, and a number of lexical and semantic feature types for automatic satire detection. Different from [8], we mainly focus on the sentence level. Nowadays in an age of an explosion of twitter and BBS, sentence level study has an increasing importance.

#### IV. DEFINITIONS OF IRONY AND SATIRE AND SATIRICAL IRONY

##### A. Definition of Irony

According to the definitions in Section II, English words irony, antiphrasis and verbal irony corresponds to Chinese concept "反语" (in the following, we use irony as a representative of those words). The core of irony is that its real sense is opposite to the superficial meaning. The ironical part of a sentence can be displayed in some words ("太低" in A1) or not (A2).

(A1) 房价是 TMD 太低了, 再涨它一百倍世界就太平了。(House prices are too damn low. The country)

(A2) 干脆, 30 岁退休就完了。(It is a good choice to retire in the age of 30.)

A1 type of sentence is especially interested because the sentiment analysis will be wrong if it is not identified. E.g, the result of sentiment analysis on A1 is "房价(house prices)->低(low)", while the correct one should be "房价(house prices)->高(high)".

##### B. Definition of Satire

In this paper, we use satire as the counterpart of "讽刺" in English. Of course, we can still use a lot of words to express the meaning of "讽刺" including mordacity, pasquinade, satire, quip, stinger, irony, caricature, burlesque, lampoon, sting, sarcasm, innuendo and nip (维科汉英词典(Weike Chinese-English Dictionary)). Despite so many words we can use, the common feature of all these words are simple. That is they all perform same functions in discourse. So the definition of "satire" (讽刺) should be functional. Its function is to cut or give pain in emotion (Merriam-Webster's 11th Collegiate Dictionary -- sarcasm) and to expose and discredit vice or folly as its purpose.

We can create a satirical sentence in many ways -- using metaphor or hyperbole mentioned in definition for example. But to determine if a statement is a satire, we should follow its functional definition as we mentioned above.

##### C. Definition of Satirical Irony and The Relationship between Irony and Satire

According to the definitions of irony and satire we can see that irony is a formal one (It's a matter of form.), while satire is a functional one (It focuses on what function it will perform). It is clear that irony and satire are not the same. Their relationship should like the figure below.

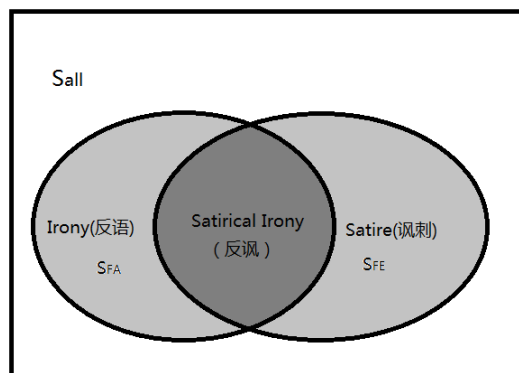


Figure 1 The relationship between irony and satiric

We define the set of all sentences as  $S_{all}$ , and the set of ironical sentences  $S_{FA} \subset S_{all}$  and the set of satirical sentences  $S_{FE} \subset S_{all}$ . The intersection of  $S_{FA}$  and  $S_{FE}$  is irony which used in satire, namely satirical irony ("反讽").

To be more specifically, first we should note that not all the irony is satirical. In other words, the function of irony is obviously more than used in a satire. For example, the following sentence is surely not a satire.

(Eg1) 总理真是太笨了, 都一把年纪了, 还是满世界的跑, 关心受灾的群众, 一点儿也不注意自己的身体。(The prim minister is such an idiot. In his old age, he travels everywhere, giving comfort to those stricken civilians, but never takes care of his own health.)

Secondly, satire do not have to use irony as its form. For example,

(Eg2) Winston Churchill who, when told by a lady that he was drunk, said "my dear, you are ugly ... but tomorrow I shall be sober"[9]

This sentence is said by Winston Churchill to satirise a lady. It belongs to neither A1 nor A2 which we mentioned in Section IV.A. But it does accomplish functions which we mentioned in Section IV.B which is to cut or gave pain.

So actually, we believe that irony can in fact be regarded as a template. By using irony, we can create a satire. In Section VI, we will pay special attention satirical irony get our special attention for two reasons 1) we believe the amount of sentences using irony as satire is much more than using it to show a positive sentiment in forums. 2) as we mentioned above, this part always leads to critical error in modern computer analysis systems -- this kind of sentences will usually be listed in sentences with positive sentiment.

## V. LEVELS OF SATIRICAL IRONY

To study satirical irony, there is another important problem we should pay attention to -- the satirised object of it (i.e. What does the sentence satirise?) In this section, we first divide satire into three levels based on objects of satires. Then we discuss on what level satirical irony occurs.

### A. Three Levels of Satire

In word level, we can use homophony only (or other methods) to accomplish a satirical effect. For example, (Eg1)美丽奸人(美利坚人)本身一贯就是穆巴拉克的支持者。(United States of America itself supports Mubarak consistently.) (In Chinese, "United States of America" and "beautiful unscrupulous traitors" are homophonic.)

(Eg2)我把他们称为“审查猪”(审查组)。中国独有的一种动物品种。(I call them "examining pigs(pigs and group are homophonic in Chinese)" -- an unique animal species in China.)

In Eg1 we can see that "美丽奸人" (beautiful unscrupulous traitors) is a satirical word but the meaning of the sentence is USA supports Mubarak which has nothing to do with satire. So Eg1 is a word-level satire. In Eg2, "审查猪" (examining pigs) is a satirical name for examining group, and the whole sentence shows a discontent toward the examining group. So it is both a word-level and a sentence-level satire. On the other hand, a satire only in sentence-level surely exists. For example, (Eg3)回头比比北京猿人, 才知道现在的生活有多幸福。(Only comparing to sinanthropus, can we know what a wonderful life we live now.)

Additionally, although the amount of above-sentence satires is not very large, it does occur in certain situations. We can not find the object of satire in the sentence. In other words, we need to understand the satirical meaning of the sentence based on information from the context or even from common knowledge. For example, (Eg4)我觉得袁世凯的帝制适合国情。(I think Yuan Shikai's imperial system is suitable to national condition..)

If we read this sentence alone, we can hardly tell what the object of the satire, even whether it is a satire. But if we read what the thread starter says (The above post is a reply.), we will know the meaning of the above sentence. The thread starter says,

某官员说高房价适合国情。(An official says that high house prices are suitable to national condition.)

So we know that the reply is to satirise the official and points out that what the official says is very absurd.

### B. Levels where Satirical Irony Occurs

As a subset of satire, satirical irony does not cover the three levels of satire evenly. The sentence-level is where satirical irony occurs most. (i.e. The satirised object of satirical irony is in the sentence.) Eg2, Eg3 above are both examples of satirical irony in sentence-level. At the same time, satirical irony does sometimes occur in above-sentence-level. That is to say, just trying

to extract the satirised object from the sentence is not enough. Eg4 is such a case. Satirical irony seldom occurs in mere word-level satire and therefore this situation is almost negligible.

## VI. FEATURES OF SATIRICAL IRONY

In this section, we will discuss features of satirical irony. The following rules are not necessary and sufficient. But with the occurrence of the following features, the sentence is more likely to be an satirical irony. Few sentences that contains no features are still satirical irony. (We examined 185 satirical ironies and found that 169 of them have features in R1-Class.)

### A. R1-Class, Rules that can be well formalized

**【R1.1】** The use of some mood particles

Although in text we do not have information such as tone or manner of speaking, to provide the reader greater opportunity to recognize an satirical irony, the writer often uses some mood particles such as "哈哈"(ahah) or "哇塞"(wow) etc. Through writing them explicitly, they play the role of tone and manner of speaking in oral language. For example, 哇塞! 我今天的四个帖子都进了回收站、荣幸啊!(Wow!What an honor! All 4 posts that I published today were put into the recycle bin..)

**【R1.2】** The occurrence of absolute words or words used to stress or emphasize

In satirical irony, there are often positive words exaggerated to extremes. That can strengthen the effect of satire. Words like "最"(most), "太"(too),"真是,真够,就是"(really,just) etc. and words like "完美"(perfect),"永远"(forever) etc. should be paid more attention. 最伟大的人民战争理论告诉我们: 要用妇女和儿童做人质牌, 要让所有人卷入残酷的战争!(The greatest people's war theory tell us that we should use women and children as hostages and involve all the people to the war.)

**【R1.3】** The use of punctuations like question mark and exclamatory mark in a consecutive manner

This feature is mentioned in [4][5][6][7]. satirical irony usually has an apparent and strong emotion[1]. Question marks and exclamatory marks used in a consecutive manner can show this emotion clearly.

肆仟 500 亿美刀啊, 真 tm 滴不是个小数, 竟然能悄无声息! 这充分体现了政府的能力!!!! 呵呵(Four hundred and fifty billion dollars! A damn big number! Unexpectedly we did not even know that! It show the government's ability clearly!!!!)

**【R1.4】** The use of quotation marks which show stress or negating to some extends

Unlike in English, we don't have capitalization like "GREAT!" in Chinese. But we can use quotation marks to accomplish the same function.

**【暴力】**这个词用的“很好”!!! 从历史上, 你一贯的立场来看, **【暴力】**是个褒义词!(Violence is a "great" word!!! Historically, you insist that violence is a commendatory term.)

【R1.5】 The use of filthy language(dirty words)  
那要按你这理想，太平间最tm理想。太平间最公平，都没穿衣服，住的也一样大小。靠~(According to your ideal life, hospital morgue is the damn best place. In hospital morgue everyone are equal. No one has clothes. Everyone live in a same size space. F\*\*k!)

【R1.6】 The use of some epithets  
尊敬的刘部长您咋地啦？腐败啦？一撸到底啦？那以后就得叫你刘秃子了。(what happened to you Dear Chief Liu ? caught corrupt? lost everything? i have to call you Bald Liu later.)

【R1.7】 The use of feudal official names and some obsolete words  
正厅级以上家属想打人，需报巡抚大人同意方可。(if the departmental-level cadres' families want to hit someone, they should get an approval from the governor.)

【R1.8】 The use of "我朝""咱朝""天朝""本朝"(my/our/great dynasty) and some special appellations  
我朝的领导都是复合型人才啊。不仅能管好打黑，还能管好食品安全。(The leaders of our dynasty are all Compound talents. They do well not only in Crime crackdown but also in food safety.)

【R1.9】 The use of some honorifics  
您这么聪明在这儿真是屈才了，您应该去智障小学当老师才对！(You really do work unworthy of your talents here. You should be a teacher at intellectual disabilities school!)

【R1.10】 The use of parallelism sentence  
买盐要买加碘盐，吃油要吃基因油，和面得和增白面，三聚氰胺，苏丹红，吊白粉加孔雀绿，我们真幸福!!!!!(We buy iodized salt, transgeneic oil, whitening flour and melamine, tonyred, formaldehyde sodium sulfoxylate , and malachite green. We are so lucky!!!!)

#### B. R2-Class Rules that can be semi-formalized

【R2.1】 The use of homophonic words  
Homophonic words can accomplish a satirical effect. Additionally, homophonic words can be humourous which is often another feature of satirical irony.  
他是一个清廉的"总桶"! 平均每年才拿 20 多亿米刀~~~~(He is a uncorrupted "total bucket"(president). He only get more than 2 billion dollars a year~~~~)

【R2.2】 A sentence with opposite meaning words in a broad sense but without a strong adversative conjunction like "虽然(although)但是(but)然而(however)"  
原始人的交换方式，以物换物。哈！又进步了！("原始"和"进步") (The exchange method used by the primitives -- barter. Aha, we make progress agian!(primitive and progress))

【R2.3】 The fact stated is inconsistent with turth  
Since such facts can be extracted from other resources (e.g. news articles), this rule can be semi-formalized.  
政府对百姓是真心实意的。物价在下降，利息在提高，房价被抑制，就业情况也很好。(The government really concerns people. The commodity

prices are going down. The interests are going up. The house prices are under control and the employment situation are good.)

#### C. R3-Class, Rules that are difficult to formalize

【R3.1】 The use of some special pattern of a sentence  
These uses of special patterns can only be sensed by human with their knowledge. This rule can hardly be used directly. For example,  
中国人民的老朋友，久经考验的国际主义战士穆巴拉克先生，于某年某月某日不幸下台，享年 N 届。(Mr. Mubarak, an old friend to Chinese people, and an experienced internationalism soldier, unfortunately stepped down some day of some month in some year,after being N years president.)

【R3.2】 Opposite meaning which can only be recognized using common knowledge  
难得文强对爱情那么忠心，当了那么大的干部了，也没娶房二奶，只是找几个漂亮的女演员。(Wenqiang is so loyal to love. He is a very powerful official, but he never have a concubine. He is only the sugar daddy of some beautiful actresses.)

【R3.3】 Statements built on absurd logic or statements which are obviously unwarranted  
当官的孩子继续当官，农民的孩子继续当农民，挺公平的啊。(The children of officials can continue to be officials. The children of farmers can continue to be farmers. This is very equal.)

## VII. CONCLUSION

In this paper, we first distinguish three concepts, i.e. irony, satire and satirical irony. Then we discuss three different levels of satire and point out in what level satirical irony occurs. Finally, we propose a set of features to help recognize satirical irony.

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