Phil 2: Puzzles and Paradoxes

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Explaining the
Liar Paradox

History of the Liar Paradox

- The liar paradox is attributed to the Greek philosopher **Epimenides** (6th century BC), a Cretan, who reportedly stated that "All Cretans are liars."

- One version of the liar paradox is attributed to the Greek philosopher **Eubulides of Miletus** (4th century BC). Eubulides reportedly asked, "A man says that he is lying. Is what he says true or false?"

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- The Indian grammarian-philosopher **Bhartrhari** (late 5th century CE) was well aware of a liar paradox which he formulated as "everything I am saying is false."

- The Persian scientist **Naṣīr al-Dīn al-Ṭūsī** (1201-1274) could have been the first to identify the liar paradox as self-referential.

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Indexicals

- Indexicals are words whose referent and meaning are determined by such contextual factors as the time, location, and intentions of the speaker. Examples:
  - *Pronouns*: I, he, she, this, that
  - *Adverbs*: here, now, actually, presently, today, yesterday, tomorrow
  - *Adjectives*: my, his, her, actual, past, present, future, left/right, up/down
- See lecture "A-Theory and B-Theory of Time," slide #5

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Self-Referential Sentences

- A self-referential sentences is a sentences that refers to themselves as a sentence.
- Examples:
  - John is reading this sentence
  - This sentence contains exactly threee erors.
  - "Ice" has three letters

Self-contradictory statements (cf. Harold Evans, *Newsman's English*, 1972, p. 182)

- Make each pronoun agree with their antecedent.
- Join clauses good, like a conjunction should.
- Verbs has to agree with their subjects.
- Don't write run-on sentences they are hard to read.
- Don't use commas, which aren't necessary.
- It's important to use your apostrophe's correctly.
- Proofread your writing to see if you any words out.
- The passive voice is to be avoided.
- Try to not ever split infinitives.
- Don't use no double negative.
- Correct spelling is essential.
- Don't abbrev.

Liar Paradox

This sentence is false

L_1: L_1 is false

- Suppose L_1 is true; then it is as it says it is – false. So L_1 is false. However, suppose that it is false. Well, false is just what it says it is, and a sentence that tells it the way it is is true. So L_1 is true. So, if L_1 is true, it is false; and if it is false, it is true. So it seems that L_1 is neither true nor false.
- This is a paradox if we assume the **principle of bivalence**. This principle states that declarative sentences such as L_1 are **either** true **or** false.

Principle of Bivalence

- *Principle of Bivalence*: Every declarative statement has exactly one truth value, either true or false.
- Motivation: "any non-defective representation of how things are in the world must be either accurate or inaccurate, true or false" (Sainsbury, p. 113).
- Are there counterexamples to the principle of bivalence (not counting aesthetic, theological and ethical judgments)?
  - You have stopped beating your wife

Analysis of the Liar Paradox

L_1: L_1 is false

By the principle of bivalence, L_1 is either true or false.

First, let's assume the L_1 is true.

1) "L_1" is true	Assumption
2) L_1	(1), Disquotation
C) "L_1" is not true	(2), Def of L_1

- (1) & (C) form a contradiction

Next, let's assume L_1 is false.

1) "L_1" is not true	Assumption
2) L_1	(1), Def of L_1
C) "L_1" is true	(2), Disquotation

- (1) & (C) form a contradiction
- Thus we can derive a contradiction from the assumption that "'L_1' is true or 'L_1' is not true." So we have a violation of the principle of bivalence.

Strengthened Liar

- Suppose we claim that L_1 is **neither true nor false**. Let's call this claim G.

  G: L_1 is neither true nor false.
- G entails that L_1 is not false. But if L_1 is not false, then not-L_1 is true. And if not-L_1 is true, then L_1 is false. So G entails a contradiction: L_1 is not false and L_1 is false.
- So we cannot solve the liar paradox by claiming that L_1 is neither true nor false.

<u>A tongue-in-cheek liar-style puzzle</u>:

A: This sentence contains seven words.

- Sentence A is clearly false. So its opposite ought to be true. Right?

B: This sentence does not contain seven words.

- Sentence B is the opposite of A and it is false too. How could this be?