Phil/LPS 31 Introduction to Inductive Logic
Lecture 2

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Topics

- Sentential Logic: Formulas
- Sentential Logic: Main connectives
- Sentential Logic: Paraphrasing English
- Truth tables
- Truth functional equivalence

Sentential Logic: Formulas

Remember that the formal symbols of sentential logic are:

1. p, q, r, s and t as symbols for sentences. If we need more than 5 symbols (rarely!), then add the following countably many symbols p_1, p_2, p_3, ...
2. $\vee$ for "or", $\neg$ for "not" since the other symbols for "and" and "if..., then..." can be defined from these. (More of this later)
3. (for left bracket and) for right bracket.

The transformation rules (also known as "syntactic rules") are:

1. Any sentence p is a formula.
2. If p is a formula, then $\neg p$ is formula.
3. If p is a formula and q is a formula, then $(p \vee q)$ is a formula.

The closure condition simply states that nothing else is a formula of sentential logic.

Sentential Logic: Formulas

Are the following formulas in sentential logic?

1. q
2. t
3. $\neg q$
4. $\neg\neg r$
5. $(\neg\neg\neg p \vee q)$
6. $(p \vee (r \vee \neg q))$
7. $((q \vee (t \vee s)) \vee (r \vee \neg p))$

Sentential Logic: Formulas

Are the following formulas in sentential logic?

1. a
2. b
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4. $\neg r\neg$
5. $(\neg \vee \neg p \vee q)$
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7. $((q \vee (t \vee s)) \vee r \vee \neg p)$

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- So using brackets is not just a stipulation of our logic, it turns out that having brackets helps us parse the formula correctly in order to identify the main connective. In (1) we can identify the main connective but in (2) we cannot. This is why brackets matter.

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