

Table 3.1  
Some Valid Patterns of Argument in ~~Sentential~~ <sup>Sentential</sup> Logic

| Pattern   | Example  |
|---|--|
| <p>A. Argument by elimination</p> <p>1. Either <math>P</math> or <math>Q</math>.</p> <p>2. <math>\sim P</math>.</p> <p>3. <math>Q</math>.</p>                                       | <p>1. Either the American League will win or the National League will win.</p> <p>2. <u>The American League won't win.</u></p> <p>3. The National League will win.</p>                                   |
| <p>B. Simplification</p> <p>1. <math>P</math> and <math>Q</math>.</p> <p>2. <math>P</math>.</p>   | <p>1. Sarah knows logic and Sam does not know logic.</p> <p>2. Sarah knows logic.</p>  |
| <p>C. Affirming the antecedent (<i>Modus ponens</i>)</p> <p>1. If <math>P</math> then <math>Q</math>.</p> <p>2. <math>P</math>.</p> <p>3. <math>Q</math>.</p>                       | <p>1. If the president is in the White House, then the president is in Washington, D.C.</p> <p>2. <u>The president is in the White House.</u></p> <p>3. The president is in Washington, D.C.</p>         |
| <p>D. Denying the consequent (<i>Modus tollens</i>)</p> <p>1. If <math>P</math> then <math>Q</math>.</p> <p>2. <math>\sim Q</math>.</p> <p>3. <math>\sim P</math>.</p>              | <p>1. If the president is in the White House, then the president is in Washington, D.C.</p> <p>2. <u>The president is not in Washington, D.C.</u></p> <p>3. The president is not in the White House.</p> |
| <p>E. Hypothetical syllogism</p> <p>1. If <math>P</math> then <math>Q</math>.</p> <p>2. If <math>Q</math> then <math>R</math>.</p> <p>3. If <math>P</math> then <math>R</math>.</p> | <p>1. If Jones passes the test, then Jones passes the course.</p> <p>2. <u>If Jones passes the course, then Jones graduates.</u></p> <p>3. If Jones passes the test, then Jones graduates</p>            |
| <p>F. Contraposition</p> <p>1. If <math>P</math> then <math>Q</math>.</p> <p>2. If <math>\sim Q</math> then <math>\sim P</math>.</p>  | <p>1. If the president is in the White House, then the president is in Washington, D.C.</p> <p>2. If the president is not in Washington, D.C., then the president is not in the White House.</p>         |
| <p>G. Equivalence</p> <p>1. <math>P</math> if and only if <math>Q</math>.</p> <p>2. <math>\sim P</math>.</p> <p>3. <math>\sim Q</math>.</p>   | <p>1. Dan is president if and only if Dan is commander in chief.</p> <p>2. <u>Dan is not president.</u></p> <p>3. Dan is not commander in chief.</p>   |

Table 3.2  
Two Invalid Patterns of Argument in Sentential Logic

| Pattern   | Example  |
|---|--|
| <p>A. Denying the antecedent</p> <p>1. If <math>P</math> then <math>Q</math>.</p> <p>2. <math>\sim P</math>.</p> <p>3. <math>\sim Q</math>.</p> | <p>1. If the president is in the White House, then the President is in Washington, D.C.</p> <p>2. <u>The president is not in the White House.</u></p> <p>3. The president is not in Washington, D.C.</p> |
| <p>B. Affirming the consequent</p> <p>1. If <math>P</math> then <math>Q</math>.</p> <p>2. <math>Q</math>.</p> <p>3. <math>P</math>.</p>         | <p>1. If the president is in the White House, then the president is in Washington, D.C.</p> <p>2. <u>The president is in Washington, D.C.</u></p> <p>3. The president is in the White House.</p>         |

Table 3.3  
Some Patterns of Valid Arguments in Predicate Logic

| Pattern  | Example   |
|--|---|
| <p>1. All <math>A</math>s are <math>B</math>s.</p> <p>2. <math>x</math> is an <math>A</math>.</p> <p>3. <math>x</math> is a <math>B</math>.</p>          | <p>1. All men are mortal.</p> <p>2. <u>Socrates is a man.</u></p> <p>3. Socrates is mortal.</p>   |
| <p>1. All <math>A</math>s are <math>B</math>s.</p> <p>2. <math>x</math> is not a <math>B</math>.</p> <p>3. <math>x</math> is not an <math>A</math>.</p>  | <p>1. All desserts are sweet.</p> <p>2. <u>This lima bean is not sweet.</u></p> <p>3. This lima bean is not a dessert.</p>                |
| <p>1. All <math>A</math>s are <math>B</math>s.</p> <p>2. All <math>B</math>s are <math>C</math>s.</p> <p>3. All <math>A</math>s are <math>C</math>s.</p> | <p>1. All fork-tailed flycatchers are birds.</p> <p>2. <u>All birds have wings.</u></p> <p>3. All fork-tailed flycatchers have wings.</p> |
| <p>1. No <math>A</math>s are <math>B</math>s.</p> <p>2. <math>x</math> is an <math>A</math>.</p> <p>3. <math>x</math> is not a <math>B</math>.</p>       | <p>1. No men are mothers.</p> <p>2. <u>Tom Cruise is a man.</u></p> <p>3. Tom Cruise is not a mother.</p>                                 |