

Notes on chapter 2, pp. 22 – 23

Although the notation may seem a little odd at first, the material covered on pp. 22 – 23 is pretty straightforward. We are thinking about the **outcomes** in a decision problem, and Resnik (the author) is introducing a precise (and, for our purposes, complete) analysis of *preferring one outcome to another* and *being indifferent between two outcomes*.

1. In this context, *preferring* has its normal meaning. *Preferring one outcome to another* means that a person (i.e., an agent) wants one outcome more than the other.
2. *Indifferent* is defined in the second full paragraph of section 2-1: “In decision theory, an agent is considered to be indifferent ...” (p. 22).
3. When we write xPy and xIy , x and y are two outcomes (or, more generally, two alternatives). See the second paragraph in section 2-1 for how to read “ xPy ” and “ xIy .”

How do we read ‘\$500 P \$400’?

How do we read ‘free meal at Restaurant Tyler I \$25’?

(The answers are at the end of this document.)

Once you are familiar with those concepts, we want to specify “a minimal set of conditions that the preferences of an ideally rational agent must satisfy” (p. 22, bot.). The author calls these conditions “the ordering conditions.” O1 – O8 on p. 23 are the ordering conditions. (Or, technically, he calls them the components of the ordering condition.)

O1 – O8 are not complicated. They just state very precisely what is required to have “rational” preferences (at any one point in time—this has nothing to do with a person’s preferences changing over time).

O1 tells us that if an agent prefers x to y , then he or she doesn’t prefer y to x . For example, if a person prefers ice cream to cake, then he or she doesn’t prefer cake to ice cream.

Looking at one more, O5 tells us that if an agent prefers x to y and also prefers y to z , then this person must prefer x to z .

For instance, let's say that the following are true for Claire.

(a) She prefers ice cream to pasta, and

(b) she prefers pasta to broccoli.

Therefore, it must also be the case (if she is rational) that (c) she prefers ice cream to broccoli.

Here are two more examples—and we will assume that the agent who has these preferences is perfectly rational, and so O₁ – O₈ are true for him or her.

For some agent,

1. apples P bananas

2. apples I carrots

3. Therefore, given 1, 2, & O₆, carrots P bananas

For some agent,

1. apples P bananas

2. bananas P eggs

3. eggs I figs

4. Therefore, 1, 2, and O₁, apples P eggs

5. Therefore, given 3, 4 & O₇, apples P figs

'\$500 P \$400' is read as 'the agent prefers [receiving] \$500 to [receiving] \$400'.

'free meal at Restaurant Tyler I \$25' is read as 'the agent is indifferent between [receiving] a free meal at Restaurant Tyler and [receiving] \$25'.

('Receiving' doesn't need to be included because possibly getting the outcome—\$500, \$400, a free meal at Restaurant Tyler, or \$25—is part of what we mean by *preferring* and *being indifferent*.)