

LA Applications (3)

3) Interpretation of Truth Qualification Results

– Given the Possibility Function:

$$(X \text{ is } F) \rightarrow \prod_x = F$$

– Then, its Truth Qualification

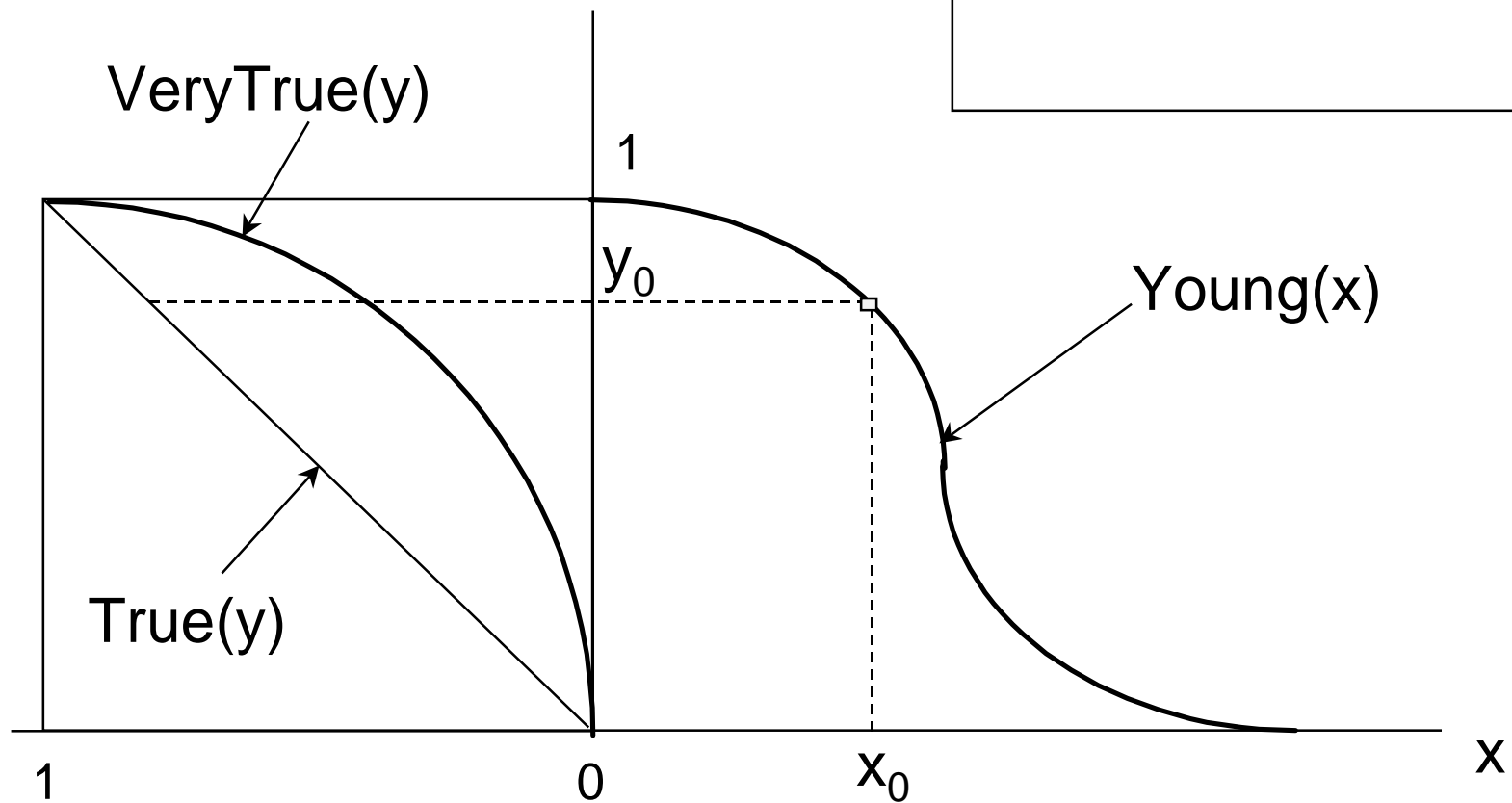
$$(X \text{ is } F) \text{ is } \tau \rightarrow \prod_x = F^*$$

- F and F^* are fuzzy sets in U , τ is a fuzzy set in $[0,1]$
- $F^*(u) = \tau(F(u))$ – using the extension principle
- The interpretation is: $LA[F^*(u)]$

LA Applications (3)

Young*(x) = Young(x) is VeryTrue

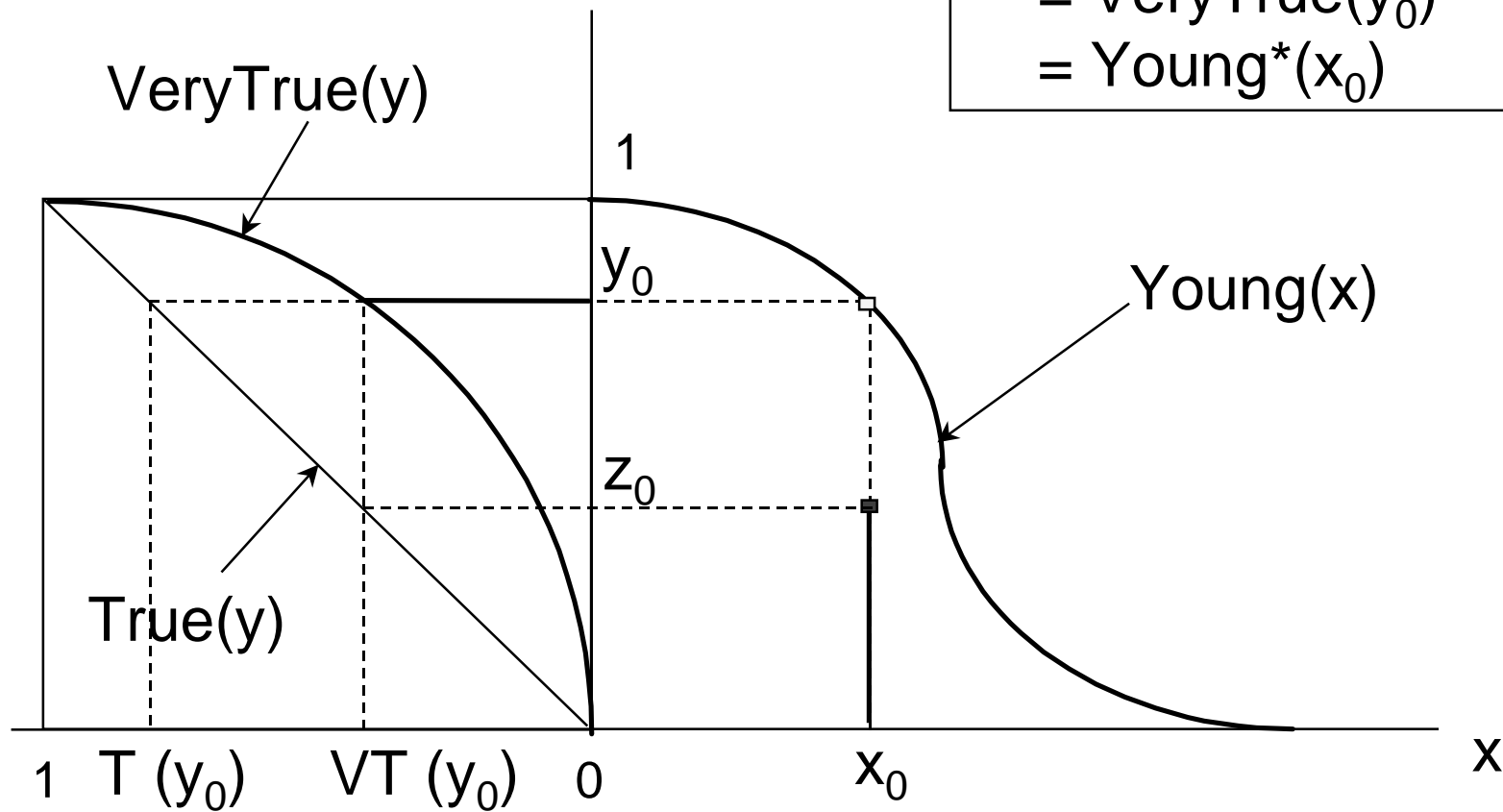
$$y_0 = \text{Young}(x_0)$$



LA Applications (3)

Young*(x) = Young(x) is VeryTrue

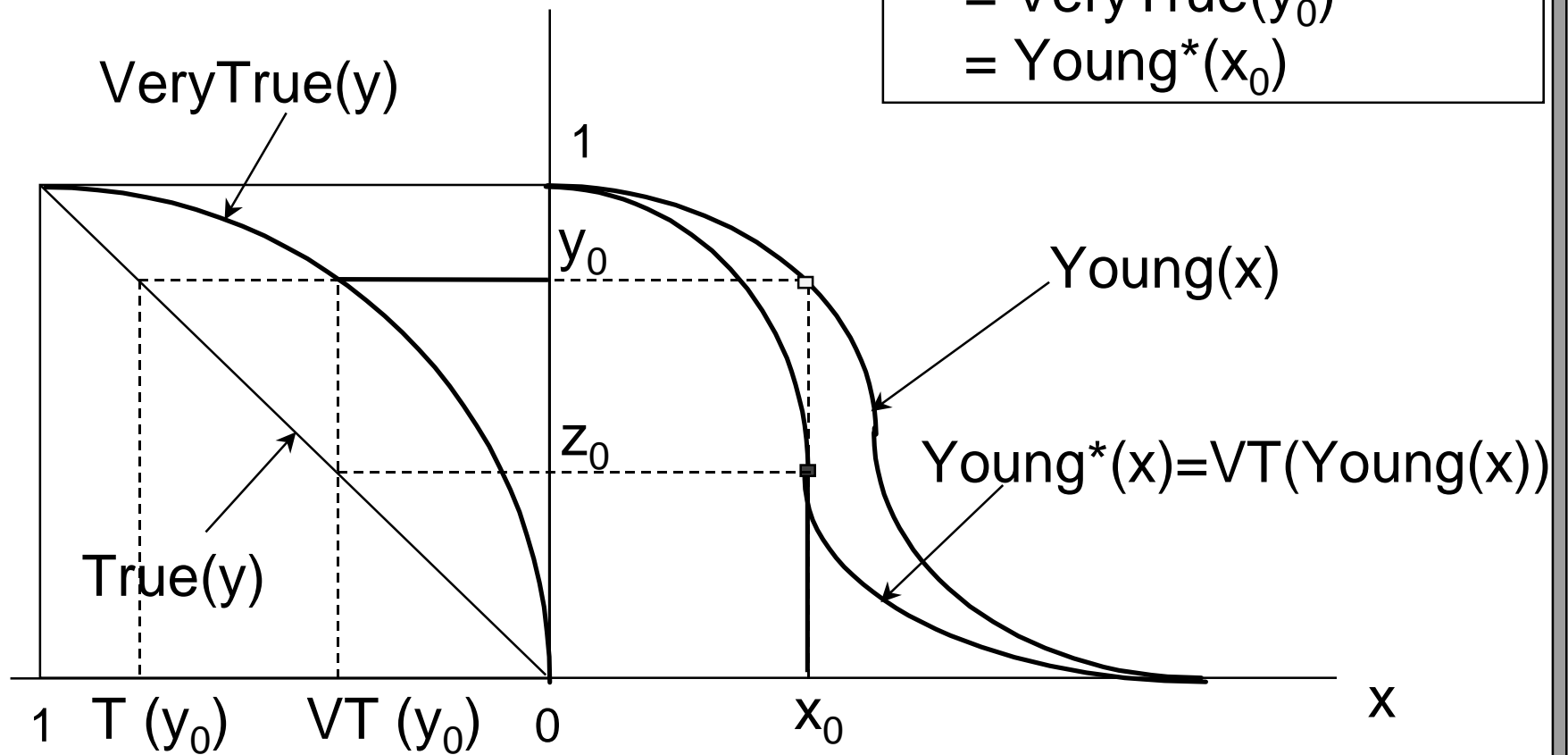
$$\begin{aligned}
 y_0 &= \text{Young}(x_0) \\
 z_0 &= \text{VeryTrue}(\text{Young}(x_0)) \\
 &= \text{VeryTrue}(y_0) \\
 &= \text{Young}^*(x_0)
 \end{aligned}$$



LA Applications (3)

Young*(x) = Young(x) is VeryTrue

$$\begin{aligned}
 y_0 &= \text{Young}(x_0) \\
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LA Applications (4)

4) Interpretation of Extension Principle Results

– Given the mapping:

$$* : U \times V \rightarrow W \quad \text{and} \quad A \subseteq U, B \subseteq V$$

– Then the result of applying the mapping $*$ to A and B can be interpreted as:

$$A * B = LA \left[\text{Sup}_{w=u*v} \text{Min}(A(u), B(v)) \right]$$

LA Applications (5)

5) Interpretation of Results of a Syntactic Substitution Process

Riddle Example

In the sequel we will see a conjunction of statements defining a set of constraints on the linguistic variable Height(Person)

LA Applications (5): Riddle

- Ann is very short & Nancy is much taller than Ann
- Gail is indeed very tall
- Nancy is not much shorter than Gail
- Paola is medium-height
- Mary is taller than Ann, but “Mary is taller than Paola” is false
- “John is very tall” is rather false, but John is taller than Paola
- Dennis is shorter than John, but Dennis is taller than Mary
- Piero is shorter than Nancy, but Piero is taller than

Paola

LA Applications (5): Queries & Answers

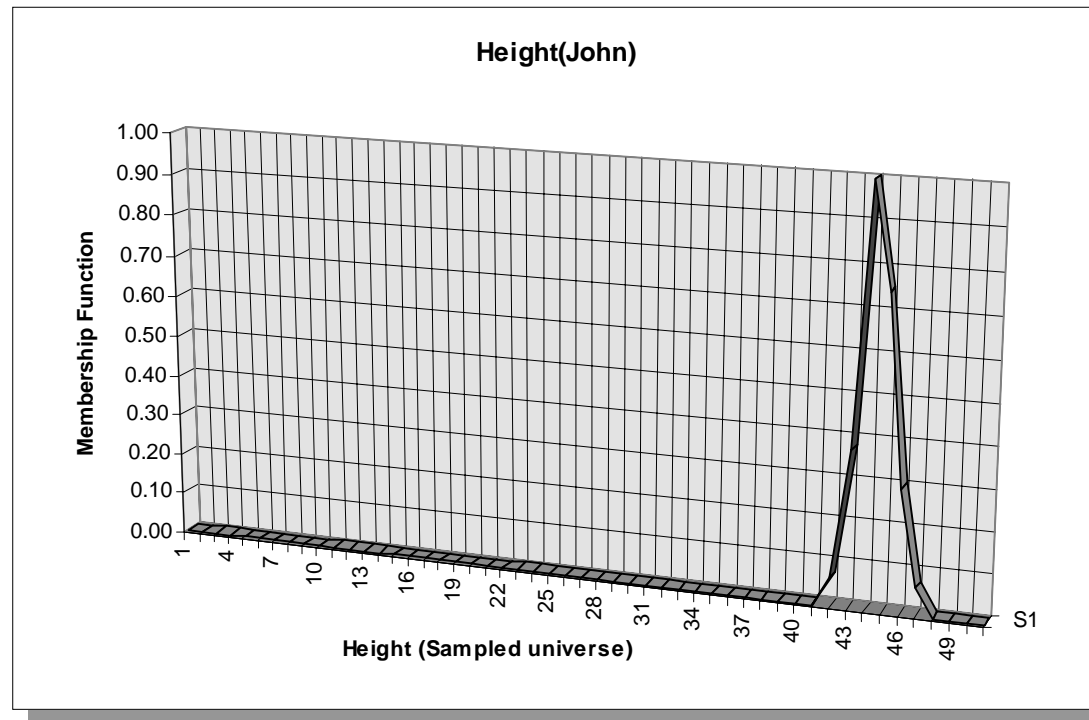
- Question:
 - “How tall is Dennis?”; “How tall is John?”
- Answers:
 - Intersection of constraints associated with Height(Dennis) or Height(John):
 - Height(John)= ((Very Tall) is Rather False) and (Taller than Medium-Height)
 - Height(Dennis)= ((Shorter than (((Very Tall) is Rather False) and (Taller than Medium-Height)) and ((Taller than ((Taller than Very Short)) and ((Taller than Medium-Height) is False))))

LA Applications (5): *Height(John)*

((Very Tall) is Rather False) and (Taller than Medium-Height)

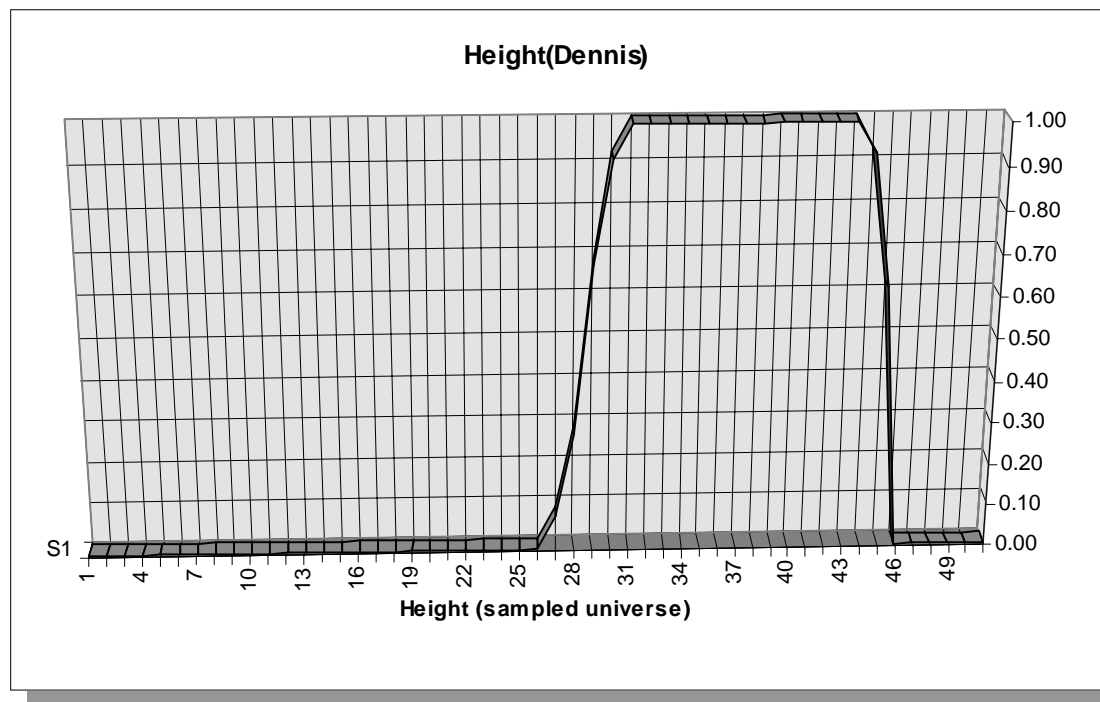


Semantic Interpreter



LA Applications (5): *Height (Dennis)*

((Shorter than ((Very Tall) is Rather False) and (Taller than Medium-Height)) and ((Taller than ((Taller than Very Short)) and ((Taller than Medium-Height) is False))) → Semantic Interpreter



LA Applications (5): Approx. of Answers

- Answers:

LA[Height(John)] =

= LA[((Very Tall) is Rather False) & (Taller than Medium-Height)] =

= Sort of Tall

LA[Height(Dennis)] =

= LA[((Shorter than ((Very Tall) is Rather False) & (Taller than Medium-Height)) & ((Taller than (Taller than Very Short)) & ((Taller than Medium-Height) is False)))] =

= Between Medium-Height and Sort of Tall