1. Lexicon

Morpheme	TYPE	Translation
every	C→∧D	$\lambda P_0 \wedge \{x \mid Px\}$
some	C→∨D	$\lambda P_0 \vee \{x \mid Px\}$
no	C→∧(D→S.→S)	$\lambda P_0 \wedge \{\lambda Q {\sim} Qx \mid Px\}$

2. Semantic Trees

1. Every man respects some woman who respects no man [reading 1].

every	man	[+1]	respects	some	woman	who	[+1]	respects	no	man	[+2]	[+2]
$\lambda P_0 \wedge \{x \mid Px\}$	$\mathbf{M}_0$					$\lambda Q \lambda P_0 \lambda x_0 \{Px \& Qx\}$	$\lambda x\{x_1\}$		$\lambda P_0 \wedge \{\lambda Q {\sim} Qx \mid Px\}$	$\mathbf{M}_0$		
$\wedge \{x \mid \mathbf{M}x\}$		$\lambda x\{x_1\}$							$\wedge \{\lambda Q {\sim} Qx \mid \mathbf{M}x\}$		$\lambda x\{x_2\}$	
								$\lambda y_2 \lambda x_1 \mathbf{R}xy$	$\wedge \{\lambda Q_2 {\sim} Qx \mid \mathbf{M}x\}$			
								$\wedge \{ \lambda x_1 {\sim} \mathbf{R}xy \mid \mathbf{M}y \}$[1]				
						$\lambda Q_1 \lambda P_0 \lambda x_0 \{ Px \& Qx \}$		$\lambda x_1 \forall y \{\mathbf{M}y \to {\sim}\mathbf{R}xy\}$				
					$\mathbf{W}_0$	$\lambda P_0 \lambda x_0 \{ Px \& \forall y \{\mathbf{M}y \to {\sim}\mathbf{R}xy\} \}$						
				$\lambda P_0 \vee \{x \mid Px\}$	$\lambda x_0 \{ \mathbf{W}x \& \forall y \{\mathbf{M}y \to {\sim}\mathbf{R}xy\} \}$							
				$\vee \{ x \mid \mathbf{W}x \& \forall y \{\mathbf{M}y \to {\sim}\mathbf{R}xy\} \}$								$\lambda x\{x_2\}$
			$\lambda y_2 \lambda x_1 \mathbf{R}xy$	$\vee \{ y_2 \mid \mathbf{W}y \& \forall z \{\mathbf{M}z \to {\sim}\mathbf{R}yz\} \}$								
$\wedge \{ x_1 \mid \mathbf{M}x \}$			$\vee \{ \lambda x_1 \mathbf{R}xy \mid \mathbf{W}y \& \forall z \{\mathbf{M}z \to {\sim}\mathbf{R}yz\} \}$									
$\wedge \{ \vee \{ \mathbf{R}xy \mid \mathbf{W}y \& \forall z \{\mathbf{M}z \to {\sim}\mathbf{R}yz\} \} \mid \mathbf{M}x \}$												
$\forall x \{ \mathbf{M}x \to \exists y \{ \{\mathbf{W}y \& \forall z \{\mathbf{M}z \to {\sim}\mathbf{R}yz\} \} \& \mathbf{R}xy \} \}$												

[1] ∧ does not admit relative pronoun phrases, so the ∧-expression must be simplified.

2. Every man respects some woman who respects no man [reading 2].

every	man	[+1]	respects	some	woman	who	[+1]	respects	no	man	[+2]	[+2]
$\lambda P_0 \bigwedge\{x \mid Px\}$	$\mathbf{M}_0$					$\lambda Q \lambda P_0 \lambda x_0\{Px \& Qx\}$	$\lambda x\{x_1\}$		$\lambda P_0 \bigwedge\{\lambda Q {\sim} Qx \mid Px\}$	$\mathbf{M}_0$		
$\bigwedge \{x \mid \mathbf{M}x\}$		$\lambda x\{x_1\}$							$\bigwedge\{\lambda Q {\sim} Qx \mid \mathbf{M}x\}$		$\lambda x\{x_2\}$	
								$\lambda y_2 \lambda x_1 \mathbf{R}xy$	$\bigwedge\{\lambda Q_2 {\sim} Qx \mid \mathbf{M}x\}$			
								$\bigwedge\{ \lambda x_1 {\sim}\mathbf{R}xy \mid \mathbf{M}y \}$[2]				
						$\lambda Q_1\ \lambda P_0\ \lambda x_0\ \{ Px \ \&\ Qx \}$		$\lambda x_1\ \forall y\{\mathbf{M}y \rightarrow {\sim}\mathbf{R}xy\}$				
					$\mathbf{W}_0$	$\lambda P_0\ \lambda x_0\ \{ Px \ \&\ \forall y\{\mathbf{M}y \rightarrow {\sim}\mathbf{R}xy\} \}$						
				$\lambda P_0 \bigvee\{x \mid Px\}$	$\lambda x_0\ \{ \mathbf{W}x \ \&\ \forall y\{\mathbf{M}y \rightarrow {\sim}\mathbf{R}xy\} \}$							
				$\bigvee \{ x \mid \mathbf{W}x \ \&\ \forall y\{\mathbf{M}y \rightarrow {\sim}\mathbf{R}xy\} \}$								$\lambda x\{x_2\}$
			$\lambda y_2 \lambda x_1 \mathbf{R}xy$	$\bigvee \{ y_2 \mid \mathbf{W}y \ \&\ \forall z\{\mathbf{M}z \rightarrow {\sim}\mathbf{R}yz\} \}$								
$\bigwedge \{ x_1 \mid \mathbf{M}x \}$			$\bigvee \{ \lambda x_1 \mathbf{R}xy \mid \mathbf{W}y \ \&\ \forall z\{\mathbf{M}z \rightarrow {\sim}\mathbf{R}yz\} \}$									
$\bigvee \{ \bigwedge \{ \mathbf{R}xy \mid \mathbf{M}x \} \mid \mathbf{W}y \ \&\ \forall z\{\mathbf{M}z \rightarrow {\sim}\mathbf{R}yz\} \}$												
$\exists y \{ \{\mathbf{W}y \ \&\ \forall z\{\mathbf{M}z \rightarrow {\sim}\mathbf{R}yz\} \} \ \&\ \forall x \{ \mathbf{M}x \rightarrow \mathbf{R}xy \} \}$												

[2] $\bigwedge$ does not admit relative pronoun phrases, so the conjunction must be simplified.

3. Every friend of every virtuous person is virtuous. [reading 1]

<table>
<tr><th>every</th><th>friend</th><th>of</th><th>every</th><th>virtuous</th><th>[mod]</th><th>person</th><th>[+1]</th><th>is</th><th>virtuous</th></tr>
<tr><td></td><td></td><td></td><td></td><td>$\mathbf{V}_0$</td><td>$\lambda Q_0 \lambda P_0 \lambda x_0\{Px \& Qx\}$</td><td></td><td></td><td>$\lambda P_0\{P_1\}$</td><td>$\mathbf{V}_0$</td></tr>
<tr><td></td><td></td><td></td><td></td><td colspan="2">$\lambda P_0\ \lambda x_0\ \{\ Px\ \&\ \mathbf{V}x\ \}$</td><td>$\mathbf{P}_0$</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>$\lambda P_0 \wedge \{x \mid Px\}$</td><td colspan="3">$\lambda x_0\ \{\ \mathbf{P}x\ \&\ \mathbf{V}x\ \}$</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>$\lambda x\{x_6\}$</td><td colspan="4">$\wedge\ \{\ x \mid \mathbf{P}x\ \&\ \mathbf{V}x\ \}$</td><td></td><td></td><td></td></tr>
<tr><td></td><td>$\lambda y_6 \lambda x_0 \mathbf{F}xy$</td><td colspan="5">$\wedge\ \{\ x_6 \mid \mathbf{P}x\ \&\ \mathbf{V}x\ \}$</td><td></td><td></td><td></td></tr>
<tr><td>$\lambda P_0 \wedge \{x \mid Px\}$</td><td colspan="6">$\wedge\ \{\ \lambda x_0 \mathbf{F}xy \mid \mathbf{P}y\ \&\ \mathbf{V}y\ \}$</td><td></td><td></td><td></td></tr>
<tr><td colspan="7">$\wedge\ \{\ \wedge\{x \mid \mathbf{F}xy\} \mid \mathbf{P}y\ \&\ \mathbf{V}y\ \}$[3]</td><td>$\lambda x\{x_1\}$</td><td></td><td></td></tr>
<tr><td colspan="8">$\wedge\ \{\ \wedge\{x_1 \mid \mathbf{F}xy\} \mid \mathbf{P}y\ \&\ \mathbf{V}y\ \}$</td><td colspan="2">$\mathbf{V}_1$</td></tr>
<tr><td colspan="10">$\wedge\ \{\ \wedge\{\mathbf{V}x \mid \mathbf{F}xy\} \mid \mathbf{P}y\ \&\ \mathbf{V}y\ \}$</td></tr>
<tr><td colspan="10">$\forall y\{\ \{\mathbf{P}y\ \&\ \mathbf{V}y\} \rightarrow \forall x\{\mathbf{F}xy \rightarrow \mathbf{V}x\}\ \}$</td></tr>
</table>

[3] $\wedge$ admits ⟦every⟧ even though it is anti-tonic.

4. Every friend of every virtuous person is virtuous. [reading 2]

every	friend	of	every	virtuous	[mod]	person	[+1]	is	virtuous
				$\mathbf{V}_0$	$\lambda Q_0 \lambda P_0 \lambda x_0 \{Px \& Qx\}$			$\lambda P_0 \{P_1\}$	$\mathbf{V}_0$
				$\lambda P_0\ \lambda x_0\ \{\ Px\ \&\ \mathbf{V}x\ \}$		$\mathbf{P}_0$			
			$\lambda P_0 \wedge \{x \mid Px\}$	$\lambda x_0\ \{\ \mathbf{P}x\ \&\ \mathbf{V}x\ \}$					
		$\lambda x \{x_6\}$	$\wedge\ \{\ x \mid \mathbf{P}x\ \&\ \mathbf{V}x\ \}$						
	$\lambda y_6 \lambda x_0 \mathbf{F}xy$	$\wedge\ \{\ x_6 \mid \mathbf{P}x\ \&\ \mathbf{V}x\ \}$							
	$\lambda x_0 \wedge \{\ \mathbf{F}xy \mid \mathbf{P}y\ \&\ \mathbf{V}y\ \}$								
$\lambda P_0 \wedge \{x \mid Px\}$	$\lambda x_0\ \forall y\ \{\ \{\mathbf{P}y\ \&\ \mathbf{V}y\} \rightarrow \mathbf{F}xy\ \}$								
$\wedge\ \{\ x \mid \forall y\ \{\ \{\mathbf{P}y\ \&\ \mathbf{V}y\} \rightarrow \mathbf{F}xy\ \}\ \}$							$\lambda x \{x_1\}$		
$\wedge\ \{\ x_1 \mid \forall y\ \{\ \{\mathbf{P}y\ \&\ \mathbf{V}y\} \rightarrow \mathbf{F}xy\ \}\ \}$								$\mathbf{V}_1$	
$\wedge\ \{\ \mathbf{V}x \mid \forall y\ \{\ \{\mathbf{P}y\ \&\ \mathbf{V}y\} \rightarrow \mathbf{F}xy\ \}\ \}$									
$\forall x\ \{\ \forall y \{\{\mathbf{P}y\ \&\ \mathbf{V}y\} \rightarrow \mathbf{F}xy\} \rightarrow \mathbf{V}x\ \}$									