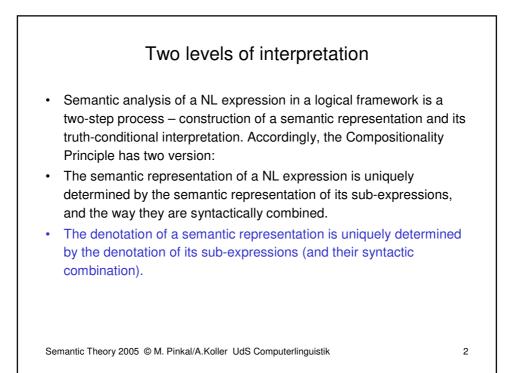
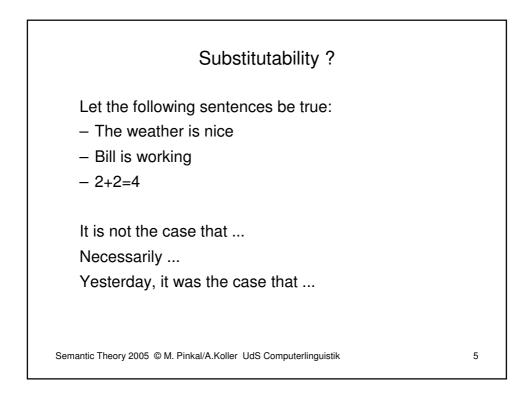
## Semantic Theory Summer 2005 Modal and Tense logic

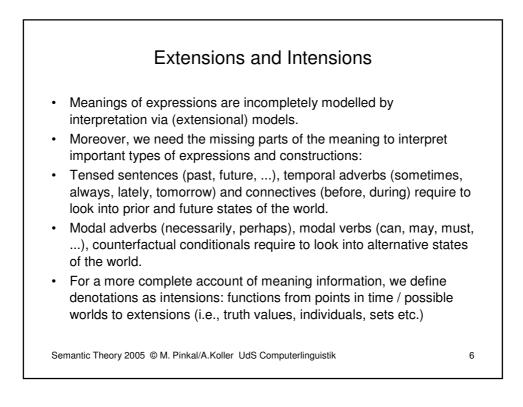
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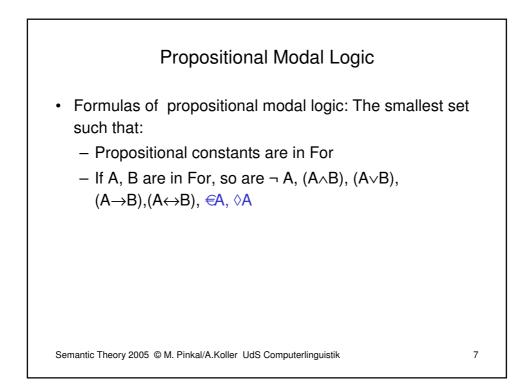


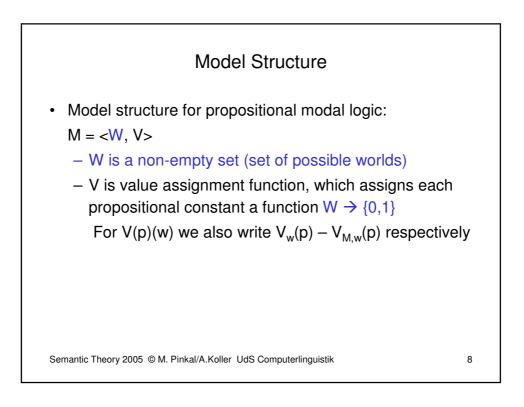
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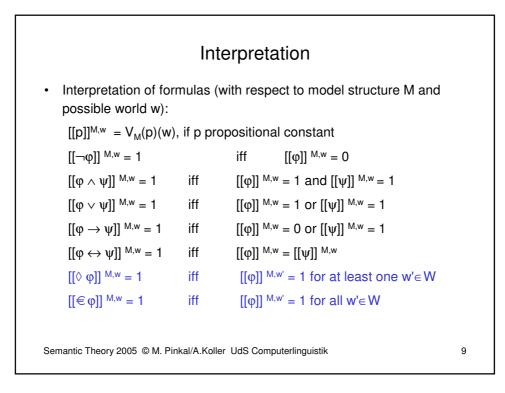
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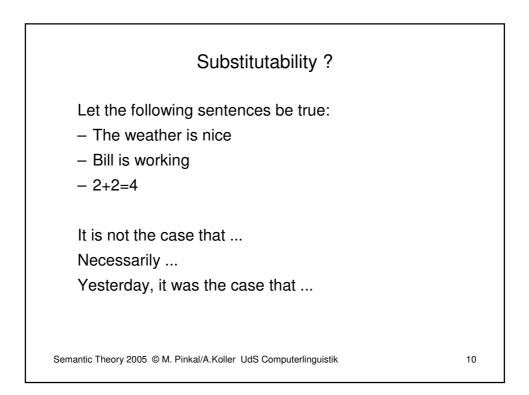


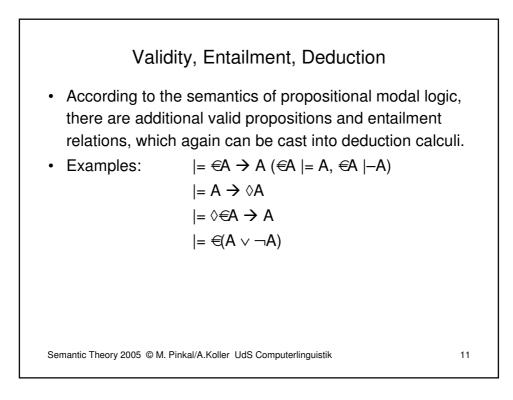


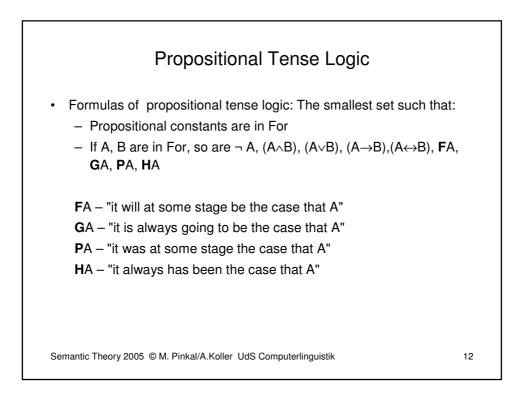


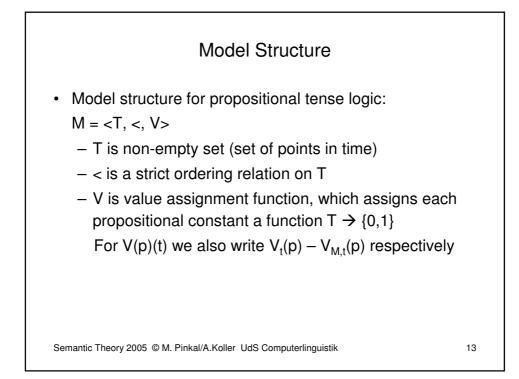




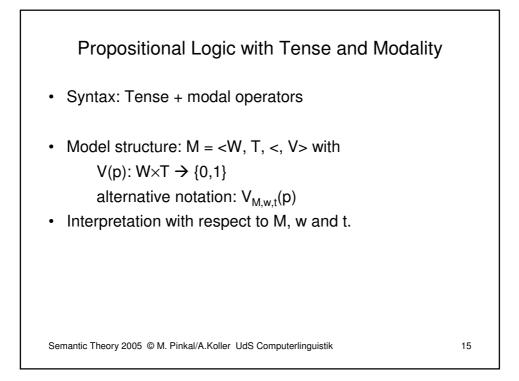


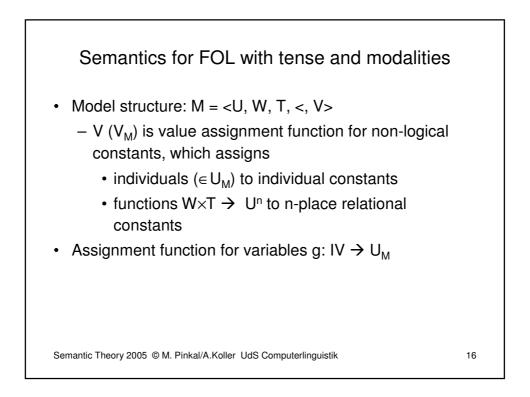


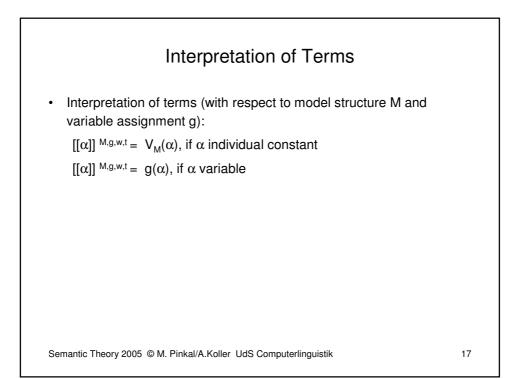




	In	terpretation	
Interpretation of form	nulas (wi	th respect to model structure M and time	e t):
$[[p]]^{M,t} = V_M(p)(w),$	if p propo	ositional constant	
$[[\neg \phi]]^{M,t} = 1$	iff	$[[\phi]]^{M,t} = 0$	
$[[\phi \land \psi]] \ ^{\text{M},t} = 1$	iff	[[\phi]] $^{M,t} = 1$ and [[ $\psi$ ]] $^{M,t} = 1$	
$[[\phi \lor \psi]]^{M,t} = 1$	iff	$[[\phi]]^{M,t} = 1 \text{ or } [[\psi]]^{M,t} = 1$	
$[[\phi \rightarrow \psi]] \ ^{M,t} = 1$	iff	$[[\phi]]^{M,t} = 0 \text{ or } [[\psi]]^{M,t} = 1$	
$[[\phi \leftrightarrow \psi]] \ ^{\text{M},t} = 1$	iff	$[[\phi]]^{M,t} = [[\psi]]^{M,t}$	
$[[\textbf{F}\phi]]^{M,t} = 1  iff$	<b>[[φ]]</b>	M,t' = 1 for at least one t'>t	
$[[\textbf{G}\phi]]^{M,t} = 1 \text{ iff}$	<b>[[φ]]</b>	<sup>M,t'</sup> = 1 for all t'>t	
$[[\textbf{P}\phi]] \ ^{M,t}=1  iff $	<b>[[φ]]</b>	M,t' = 1 for at least one t' <t< td=""><td></td></t<>	
$[[\textbf{H}\phi]]^{M,t} = 1 \text{ iff}$	<b>[[φ]]</b>	<sup>M,t'</sup> = 1 for all t' <t< td=""><td></td></t<>	
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	In	terpretation	
<ul> <li>Interpretation of form assignment g, world</li> </ul>		th respect to model structure M, variable me t):	
[[R( $t_1,, t_n$ )]] <sup>M,g,w,t</sup> = 1 iff		$\langle [[t_1]] \overset{M,g,w,t}{,}, [[t_n]] \overset{M,g,w,t}{,} \rangle \in V_M(R)(w,t)$	
$[[s=t]]^{M,g,w,t} = 1$	iff	$[[s]] ^{M,g,w,t} = [[t]] ^{M,g,w,t}$	
$[[\neg \phi]]^{M,g,w,t} = 1$		$\label{eq:main_state} iff \qquad [[\phi]]^{M,g,w,t}=0$	
$[[\phi \land \psi]]^{M,g,w,t} = 1$	iff	$[[\phi]]^{M,g,w,t} = 1 \text{ and } [[\psi]]^{M,g,w,t} = 1$	
etc.			
$[[\exists x \phi]]^{M,g,w,t} = 1$	iff	there is $a \in U_M$ such that $[[\phi]]^{M,g[x/a],w,t} = 1$	
$[[\forall x \phi]] \ ^{M,g,w,t} = 1$	iff	for all $a \in U_M$ : [[ $\phi$ ]] <sup>M,g[x/a],w,t</sup> = 1	
$[[F\phi]]^{M,g,w,t} = 1$	iff	[[ $\phi$ ]] M <sub>,g,w,t'</sub> = 1 for at least one t'>t	
etc.			
	iff	$[[\phi]] M,g,w',t = 1$ for all w' $\in W$ , etc.	

## De dicto/de re readings

De dicto/de re readings:

• The American president has always been married to Laura Bush

Only de re reading is true.

 By constitution, the American president is the Supreme Commander of the Armed Forces.
 Only de dicto reading is true.

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