On Enforcing a Constraint in Argumentation

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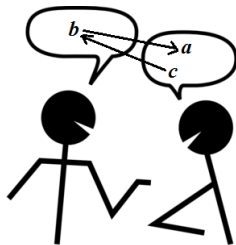
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Argumentation

Reasoning model based on arguments, on relationships between arguments (notably attacks), and on their evaluation.

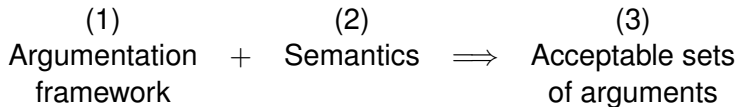Useful for decision making, persuasion, negotiation. . .

a: "I should access this building because I have a meeting inside."
b: "There is no meeting inside today."
c: "The meeting was planned yesterday, but it has been postponed to today!"

Argumentation system

Argumentation system

(1) Argumentation framework	$+$	(2) Semantics	$\implies$	(3) Acceptable sets of arguments

Example:

$$c \longrightarrow b \longrightarrow a \quad + \quad \text{Grounded} \quad \implies \quad \{a, c\}$$
$$\text{semantics}$$

Constraints

(1)	(2)	(3)
Argumentation	Semantics	Acceptable sets
framework		of arguments
$\uparrow$	$\uparrow$	$\uparrow$
structural	semantic	acceptability
constraint	constraint	constraint
e.g. in addition,	e.g. Stable	e.g. *b* should be in
$d \rightarrow c$	semantics	an acceptable set
	instead	

- These 3 kinds of constraints can be combined

Constraints

|		
(1)	(2)	(3)
Argumentation framework	Semantics	Acceptable sets of arguments
↑	↑	↑
structural constraint	semantic constraint	acceptability constraint
e.g. in addition, $d \rightarrow c$	e.g. Stable semantics instead	e.g. b should be in an acceptable set

- These 3 kinds of constraints can be combined

How to enforce a constraint?

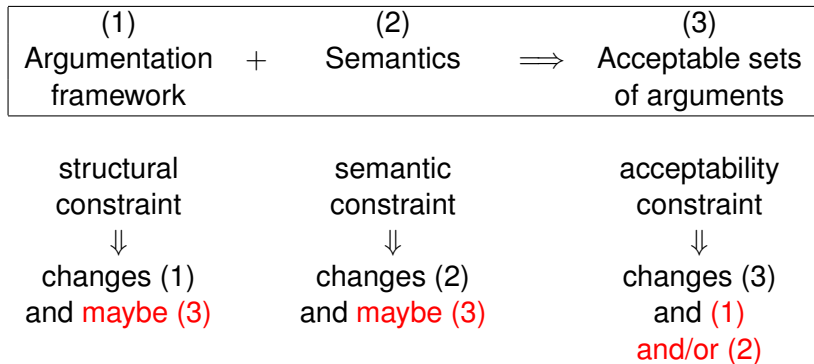|				
(1) Argumentation framework	$+$	(2) Semantics	$\implies$	(3) Acceptable sets of arguments
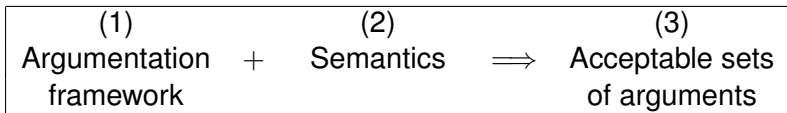
structural constraint
$\Downarrow$
enforced by changing (1)

semantic constraint
$\Downarrow$
enforced by changing (2)

acceptability constraint
$\Downarrow$
enforced by changing (1) and/or (2)

Consequences of the enforcement

(1) Argumentation framework	+	(2) Semantics	$\Longrightarrow$	(3) Acceptable sets of arguments

structural
constraint
$\Downarrow$
changes (1)
and maybe (3)

semantic
constraint
$\Downarrow$
changes (2)
and maybe (3)

acceptability
constraint
$\Downarrow$
changes (3)
and (1)
and/or (2)

Example

Argumentation system and constraint to enforce:

(1)		(2)		(3)
$c \longrightarrow b \longrightarrow a$	$+$	Grounded semantics	$\implies$	$\{a, c\}$

$$\uparrow$$
b in an
acceptable set

Enforcement:

(1')		(2)		(3')
$d \longrightarrow c \longrightarrow b \longrightarrow a$	$+$	Grounded semantics	$\implies$	$\{d, b\}$

Argumentation
Enforcement of a constraint
Survey
Enforcement of a constraint
Enforcement of a combination of constraints
Conclusion
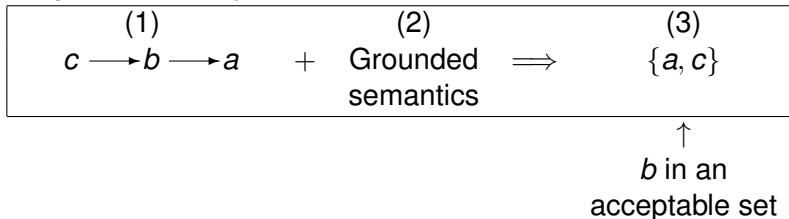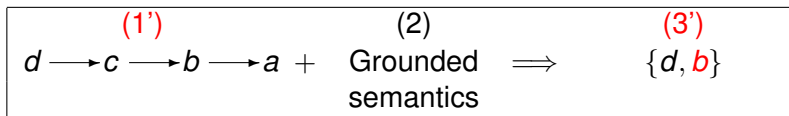
Survey – Enforcement of a constraint

		Change		
		on (1)	on (2)	on (3)
Constraint	on (1)	req'd	–	ensued
	on (2)	–	req'd	ensued
	on (3)	with	–	req'd
		–	with	req'd
		with	with	req'd

Cayrol et al. 08

Baumann 12
Coste et al. 13
Kontarinis et al. 13

Baumann et al. 10

Argumentation
Enforcement of a constraint
Survey

Enforcement of a constraint
Enforcement of a combination of constraints
Conclusion

Survey – Enforcement of a combination of constraints

		Change		
		on (1)	on (2)	on (3)
Constraint	on (1)+(3)	req'd	–	req'd
		req'd	with	req'd
	on (2)+(3)	with	req'd	req'd
		–	req'd	req'd
	on (1)+(2)	req'd	req'd	ensued
	on (1)+(2)+(3)	req'd	req'd	req'd

Bisquert et al. 13
Booth et al. 13

Dvořák et al. 13

Argumentation
Enforcement of a constraint
Survey
Enforcement of a constraint
Enforcement of a combination of constraints
Conclusion

Conclusion

- Classification
    - of constraints to enforce on an argumentation system
    - of dynamic ways to enforce them

- Survey of current work on the dynamic enforcement of a constraint in the light of this classification

- Issues remain to be investigated:
    - semantic constraint and changes
    - some combinations of constraints, their enforcement and consequences