

Refutation of block argumentation

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Abstract: We evaluate the approach of block argumentation using the legal example of a popular case. Three scenarios are *not* tautologous. We attempt to resuscitate the method by substitution of generic block argumentation and also by testing the consequent parts separately. The equations were *not* tautologous, hence refuting the block argumentation approach as presented.

We assume the method and apparatus of Meth8/VL4 with Tautology as the designated *proof* value, **F** as contradiction, N as truthity (non-contingency), and C as falsity (contingency). For results, the 16-valued truth table is row-major and horizontal, or repeating fragments of 128-tables, sometimes with table counts, for more variables. (See ersatz-systems.com.)

LET p, q, r, s, t, u, v, w, x, y, z: a1, a2, a3, a4, a5, a6, a7, a8, x, y, z;
~ Not, ¬; + Or, ∨, ∪; - Not Or; & And, ∧, ∩; \ Not And;
> Imply, greater than, →, ≻; < Not Imply, less than, ≪
= Equivalent, ≡, ≐, :=, ⇔, ↔; @ Not Equivalent, ≠;
% possibility, for one or some, ∃, ∅, M; # necessity, for every or all, ∀, □, L;
(z=z) T as tautology; (z@z) F as contradiction;
(%z<#z) C as contingency, Δ, ordinal 1;
(%z>#z) N as non-contingency, ∇, ordinal 2;
~(y < x) (x ≤ y), (x ⊆ y).

From: Arisaka, R.; Bistarelli, S.; Santini, F. (2019). Block argumentation.
arxiv.org/pdf/1901.06378.pdf
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"[I]n Section 2 we motivate our approach with a real legal example from a popular case.

a1: After the victim was attacked with VX, the suspect walked quickly to a restroom for washing hands. (a1.1)

p; (a1.2)

a2: The suspect knew VX was on her hands. (a2.1)

q; (a2.2)

a3: The suspect was acting for a prank video. (a3.1)

r; (a3.2)

a4: The suspect adjusted her glasses with VX on her hands before walking to the restroom. (a4.1)

s; (a4.2)

a5: Malaysian authorities are biased against the suspect, tampering with evidence by intentional omission of relevant CCTV footage. (a5.1)

$t=(z@z)$; (a5.2)

a6: *a1* supports *a2*. (a6.1)

$u=(p>(q=(z=z)))$; (a6.2)

a7: *a4* attacks *a2*. (a7.1)

$v=(s>(q=\sim(z=z)))$; (a7.2)

a8: *a7* attacks *a6*." (a8.1)

$w=(v>(u=\sim(z=z)))$; (a8.2)

Argumentation:

Remark A.1: Argumentation assumes the relevant definitions from a1.1-a8.1 above.

A: *a1* supports *a2*; *a2* attacks *a3*; *a4* attacks *a2*
a7 attacks *a6*; *a8* supports *a5*. (A.1)

$((((t=(z@z))\&(u=(p>(q=(z=z))))\&((v=(s>(q=\sim(z=z))))\&(w=(v>(u=\sim(z=z)))))))\>$
 $((((p>(q=(z=z)))\&(q>(r=\sim(z=z))))\&v)\&((v>(u=\sim(z=z)))\&(w>(t=(z=z))))))$;
TTTT TTTT TTTT TTTT (13) , **F T F F F T F F F T T T T** (1) ,
T F T T T F T T T F T T T (1) , TTTT TTTT **T T F F T T F F** (1) (A.2)

B: *a1* supports *a2*; *a4* attacks *a2*. (B.1)

$((u=(p>(q=(z=z))))\&(v=(s>(q=\sim(z=z))))\>(u\&v))$;
TTTT TTTT TTTT TTTT (8) , TTTT TTTT **T T F F T T F F** (4) ,
T F T T T F T T T F T T T (4) (B.2)

C: *a1* supports *a2*; *a4* attacks *a2*; (*a1* supports *a2*) and (*a4* attacks *a2*) supports *a5*. (C.1)

$((((t=(z@z))\&(u=(p>(q=(z=z))))\&(v=(s>(q=\sim(z=z)))))\>((u\&v)\>t))$;
TTTT TTTT TTTT TTTT (14) , **F T F F F T F F F T T T T** (2) (C.2)

"Then we can model the example argumentation as in A . Malaysian Police uses *a1* for *a2* (*a1* supports *a2*) to dismiss *a3* (*a2* attacks *a3*). All these three arguments are made available to the audience. The defence lawyer uses *a4* to counter *a2*. *a4* is also available to the audience as attacking *a2*. He then uses *a7*, which is itself an argumentation, to attack Malaysian Police' argumentation *a6*. This is also presented to the audience. Finally, he uses *a8*, an argumentation, for *a5*."

Remark A.B.C: The authors do not predict or show which argumentation block of

A, B, C is tautologous.

"Arguments of the kinds of a_6 , a_7 and a_8 are themselves argumentations, so " a_7 attacks a_6 " could be detailed as in B , and " a_8 supports a_5 " as in C."

Remark D.1: Argumentation A can be rewritten to include generic expansions for B and C as a_1 supports a_2 ; a_2 attacks a_3 ; a_4 attacks a_2 ; B; C, although the authors do not show exactly how. Because C contains no reference to w , the assumption of w may be removed from the antecedent of A, although not considered by the authors. (D.1)

$$\begin{aligned} & (((t=(z@z))\&(u=(p>(q=(z=z))))\&(v=(s>(q=\sim(z=z))))))\> \\ & (((p>(q=(z=z))\&(q>(r=\sim(z=z))))\&v)\&((u\&v)\&((u\&v)\>t))) ; \\ & \text{TTTT TTTT TTTT TTTT (10) , TTTT TTTT TFFF TFFF (2) ,} \\ & \text{TFTT TFTT TFTT TFTT (2) , FFFF FFFF FTTT FTTT (2) } \end{aligned} \quad (\text{D.2})$$

Eqs. A.2-D.2 as rendered are *not* tautologous, thereby refuting the approach of block argumentation as presented. The authors proceed to predict graphical (syntactic) and semantic constraints which we can not confirm.

Remark E: To resuscitate the approach we test each argument separately as the consequent in Eq. A.1 with respective assumptions. (E.0)

$$\begin{aligned} & ((t=(z@z))\&(u=(p>(q=(z=z))))\>(((p>(q=(z=z))\&(q>(r=\sim(z=z))))\&v)) ; \\ & \text{TFTT TFTT TFTT TFTT (4) , TTTT TTTT TTTT TTTT (8) ,} \\ & \text{TTTT TFFF TFFF TFFF (2) , TTTT TFFF TTTT TFFF (2) } \end{aligned} \quad (\text{E.1.2})$$

$$\begin{aligned} & ((u=(p>(q=(z=z))))\&(v=(s>(q=\sim(z=z))))\>(u\&v)) ; \\ & \text{TTTT TTTT TTTT TTTT (8) , TTTT TTTT TFFF TFFF (4) ,} \\ & \text{TFTT TFTT TFTT TFTT (4) } \end{aligned} \quad (\text{B.2})= (\text{E.2.2})$$

$$\begin{aligned} & (((t=(z@z))\&(u=(p>(q=(z=z))))\&(v=(s>(q=\sim(z=z)))))\>((u\&v)\>t)) ; \\ & \text{TTTT TTTT TTTT TTTT (14) , FFFF FFFF FTTT FTTT (2) } \end{aligned} \quad (\text{C.2})= (\text{E.3.2})$$

Eq. E1.2-3.2 are *not* tautologous, hence not resuscitating the approach of block argumentation.