

# Is multipolarity a political myth? Towards a formal theory of polarization of the world system<sup>1</sup>

Victor A. Svetlov

Petersburg State Transport University, St. Petersburg, Russia

## Abstract

It is proved that the world system which is in conflict state can not have any pole. If the world system is in conflict free state, then it can have only one or two poles. If the world system has one pole then it is synergetic one, if the world system has two poles then it is antagonistic one. Conflict state of the world system is unstable and depending on internal and external conditions tends to polarization on one or two poles. Representing two and only two possible outcomes of resolution of any conflict both synergetic and antagonistic states of the world system under certain conditions can remain stable very long time.

## 1. The Problem

At the end of the last century the Warsaw Pact was dissolved; then the Soviet Union ceased to exist. The Cold War terminated, and the bipolar partition of the world system into two antagonistic war-political blocks that were created after the Second World War vanished. The end of the epoch of bipolar separation makes the search for general regularities in polarization of the world system a very topical and important enterprise for investigation. Without a general solution of the problem of polarization it is impossible to understand, for example, what polar configurations of the world system might occur in the near future, and which of them are possible in principle.

In contrast to the widespread everyday belief amongst politicians about the coming of a multipolar era, specialists in world relations are not unanimous in estimating the most probable configuration of the world system after the termination of the Cold War. On the basis of analysis of the most influential exploratory paradigms, Huntington (2003) deduced the following possible outcomes of polarization of the world system in the foreseeable future:

- There will be one (rather harmonious) world (Fukuyama 1995).
- Despite inevitable economic interplay and interdependence, the cultural opposition of West and East will never vanish (Northrop 1947).
- The world system will be divided into a set of nation states acting separately. Each of them will aspire to survive in alliances with other nation states or will accumulating their inner potential independently (Waltz 1993).
- The world system will run into a state of complete chaos. Nation states will dissolve, tribal and ethnic conflicts will increase, terrorism will become a universal phenomenon, and world criminal patterns will appear (Brzezinski 1993).
- The world system will be partitioned into two global sets — Western civilization and a small set (no more than seven or eight in number) of irrelevant non-Western civilizations. all ones. The nation states will remain the leading players on the world arena, but conflict between them will be by and large conditioned by an accessory to two specified sets (Huntington 2003).

Each of the forecasts outlined by Huntington (including and his own) predicts the result of polarization of the world system after the termination of the Cold War. There is no doubt that each of them has a clear foundation. More important, however, the paradigms delineated by Huntington do not yield a *general* solution of the polarization problem.

---

<sup>1</sup> I express deepest thanks to Prof. Jim Bryant for helping in proof-reading of a draft of this paper.

This paper takes the polarization problem as a scientific challenge, and seeks a formal solution that is independent of cultural, ideological, economical and other non-formal aspects. It will be shown that the polarization of nation states accords with four well-known rules ('axioms') of interpersonal behavior:

1. A friend of my friend is my friend.
2. An enemy of my friend is my enemy.
3. A friend of my enemy is my enemy.
4. An enemy of my enemy is my friend.

These rules completely constitute the results of polarization of the world system irrespective of social, cultural and any other characteristics of the nation states considered.

## 2. Analysis

Let  $WS = (a, b, c, \dots)$  denote the World System, whose members are the individual nation states  $a, b, c, \dots$ .

Let  $x, y, z, \dots$  be individual variables over the members of  $WS$ .

Let  $(x)$  and  $(Ex)$  be universal and existence quantifiers accordingly.

Let the symbols  $\otimes, \oplus, \neg$  represent the operations of multiplying, adding and negating (denial of) relations respectively.

Then we can establish the Cartesian product  $WS \times WS$  a relation of positive ( $P$ ), negative ( $N$ ), conflict ( $C$ ), relevant ( $R$ ) and irrelevant ( $IR$ ) connection according to the following five definitions, in which  $Pr$  is a probability measure determined on the set of all subsets of  $WS$ :

**Definition 1.** A nation state  $a$  is *positively* related to a nation state  $b$ , if and only if the degree of probability  $b$  on given  $a$  is more than 0.5:  $Pr(b/a) > 0.5$ .

**Definition 2.** A nation state  $a$  is *negatively* related to a nation state  $b$ , if and only if the degree of probability  $b$  on given  $a$  is less than 0.5:  $Pr(b/a) < 0.5$ .

**Definition 3.** A nation state  $a$  *does not depend* on a nation state  $b$  ( $a$  is *irrelevant to*  $b$ ), if and only if the degree of probability  $b$  on given  $a$  is equal to 0.5:  $IR_{ab} = Pr(b/a) = 0.5$ .

**Definition 4.** A nation state  $a$  *depends* on a nation state  $b$  ( $a$  is *relevant to*  $b$ ), if and only if  $a$  is related to  $b$  positively or negatively:  $R_{ab} = P_{ab} \oplus N_{ab}$ .

**Definition 5.** A nation states  $a$  and  $b$  are in a *conflict state*, if and only if  $a$  is related to  $b$  both positively and negative:  $C_{ab} = P_{ab} \otimes N_{ab}$ .

The kinds of possible connection of the nation states  $a$  and  $b$  are summarized in Table 1.

	$N_{ab}$	$\neg N_{ab}$
$P_{ab}$	$C_{ab}$	$P_{ab}$
$\neg P_{ab}$	$N_{ab}$	$IR_{ab}$

TABLE 1. The kinds of possible connection of nation states  $a$  and  $b$

Now let  $PL$  mean a pole of the world system  $WS$  formed by its some members. Then we make two further definitions:

**Definition 6.** A nation state  $a$  forms a *unipolar* system with a nation state  $b$ , if and only if  $a$  and  $b$  are related to each other only positively:  $PL_{ab} = P_{ab} \otimes \neg N_{ab}$ . The full definition of a unipolar system is as follows:  $PL_{xy} = (x)(y)[(x \neq y) \rightarrow (P_{xy} \otimes \neg N_{xy})]$ .

**Definition 7.** A nation state  $a$  forms a *bipolar* system with a nation state  $b$ , if and only if  $a$  and  $b$  are related to each other only negatively:  $PL_a \oplus PL_b = N_{ab} \otimes \neg P_{ab}$ . The full definition of a bipolar system is as follows:  $PL_x \oplus PL_y = (x)(y)(z)\{[(x \neq y) \& (x \neq z)] \rightarrow [(N_{xy} \otimes \neg P_{xy}) \otimes ((N_{xz} \otimes \neg P_{xz}) \otimes P_{yz} \otimes \neg N_{xz}) \oplus (N_{yz} \otimes \neg P_{yz} \otimes P_{xz} \otimes \neg N_{xz})]\}$ .

The two remaining definitions that we require assume knowledge of the basic principles and terminology of drama theory and confrontation analysis (Bennett 1998, Bryant 2003, Howard 1999):

**Definition 8.** A nation state  $a$  faces a Deterrence Dilemma ( $DD_a$ ) in relation to nation state  $b$  if and only if the Threaten Future,  $t$ , does not convince  $b$  to accept  $a$ 's position ( $b$  is under no pressure to accept  $a$ 's position):  $N_{ab} \otimes \neg P_{ab} \otimes N_{at} \otimes \neg P_{at} \otimes P_{bt} \otimes \neg N_{bt}$ . The full definition of a bipolar system now looks as follows:  $(x)(y)(Et)[(x \neq y) \rightarrow (N_{xy} \otimes \neg P_{xy} \otimes N_{xt} \otimes \neg P_{xt} \otimes P_{yt} \otimes \neg N_{yt})]$ .

**Definition 9.** If the world system  $WS$  is unipolar, then it does not face any drama-theoretic dilemmas (with the possible exception of non-essential threat dilemmas).

Having been introduced with the help of Definitions 1 to 5 the relations  $P, N, C, R, IR$  can be added and multiplied to form more complex relations. For the purposes of the present paper it is enough to determine only the multiplying matrix of relations of a different modality (see Table 2).

$\otimes$	$P$	$N$	$C$	$R$	$IR$
$P$	$P$	$N$	$C$	$R$	$IR$
$N$	$N$	$P$	$C$	$R$	$IR$
$C$	$C$	$C$	$C$	$C$	$IR$
$R$	$R$	$R$	$C$	$R$	$IR$
$IR$	$IR$	$IR$	$IR$	$IR$	$IR$

TABLE 2. The multiplying matrix of relations

From the multiplying matrix, it follows that the relation of independence  $IR$  is steadiest: it persists after being multiplied by any other relation. It is possible to consider  $IR$  as identity element in the algebra of relations. Second in terms of stability is the conflict relation  $C$ , followed by  $R$ , the relevance relation. The relations of positive connection,  $P$ , and of relevant connection,  $R$ , are reflexive, symmetrical and transitive (i.e. they represent equivalence relations). The relation of negative connection  $N$  is not reflexive and not transitive, but is symmetrical. The relations of irrelevant connection  $IR$  and conflict connection  $C$  are not reflexive, but are symmetrical and transitive.

The idea of polarization intuitively means a partition of the nation states of the world system  $WS$  into non-intersecting, exhaustive sets. (poles). Thus the problem of polarization is transformed into the problem of partitioning the world system  $WS$  into equivalent classes. Only two relations have the property of equivalence: the dependence relation  $R$  and the positive connection  $P$ . So each of them indicates the basis for partition of the world system  $WS$  into non-intersecting, exhaustive sets. At first with the help of a dependence relation the set of all states is dichotomized into sets of dependent and independent states. Then the set of the dependent nation states is divided into positively and negatively dependent subsets with a non-empty area of intersection. This means, that independence, positive and negative dependences represent a set of elementary relations, in terms of which the formal study of polarization becomes possible.

The major results of analysis are now formulated as principal theorems of a formal theory of world relations. These are discussed informally in the following, concluding part of the present paper..

**Theorem 1.** *In the world system  $WS$ , nation states are dependent on each other then and only then, when it is false that they are independent of each other:  $(x)(y) (R_{xy} \leftrightarrow \neg IR_{xy})$ .*

**Proof**

1.  $(x)(y) R_{xy}$  (the assumption of direct proof)
2.  $(x)(y) \neg \neg R_{xy}$  (1)
3.  $(x)(y) \neg \neg [(Pr (y/x) > 0.5) \oplus (Pr (y/x) < 0.5)]$  (2, Definition 4)
4.  $(x)(y) \neg [Pr (y/x) = 0.5]$  (3, Definition 3)
5.  $(x)(y) \neg IR_{xy}$  (4, Definition 3)
6. A proof of converse implication is analogical. **QED**

According to Theorem 1 the dependent nation states form an equivalent class with relevance as the common attribute which is inherent in no independent nation state.

**Theorem 2.** *In the world system  $W$ , all nation states dependent on each other are in a positive connection with each other then and only then, when it is false they are in a negative connection with each other:  $(x)(y) (P_{xy} \leftrightarrow \neg N_{xy})$ .*

**Proof**

1.  $(x)(y) P_{xy}$  (the assumption of direct proof)
2.  $(x)(y) \neg \neg P_{xy}$  (1)
3.  $(x)(y) \neg \neg [Pr(y/x) > 0, 5]$  (2, Definition 1)
4.  $(x)(y) \neg IR_{xy} \otimes \neg [Pr(y/x) \leq 0, 5]$  (3, the assumption of relevance)
5.  $(x)(y) \neg [Pr(y/x) < 0, 5]$  (4, Theorem 1)
6.  $(x)(y) \neg N_{xy}$  (4, Definition 2)
7. A proof of converse implication is analogical. **QED**

According to Theorem 2 among the dependent nation states the positively connected ones form the equivalent class, the common attribute of which (namely, positive relevance) is not inherent in any negatively dependent state.

**Theorem 3.** *In the world system  $WS$ , couples of dependent nation states are in a conflict free state then and only then,, when they are connected with each other or only positively or only negativel[?]:  $(x)(y) \{(R_{xy} \otimes \neg C_{xy}) \leftrightarrow [(P_{xy} \otimes \neg N_{xy}) \oplus (\neg P_{xy} \otimes N_{xy})]\}$ .*

**Proof**

1.  $(x)(y) (R_{xy} \otimes \neg C_{xy})$  (the assumption of direct proof)
2.  $(x)(y) [(P_{xy} \oplus N_{xy}) \otimes \neg (P_{xy} \otimes N_{xy})]$  (1, Definition 4 и 5)
3.  $(x)(y) [(P_{xy} \oplus N_{xy}) \otimes (\neg P_{xy} \oplus \neg N_{xy})]$  (2)
4.  $(x)(y) [(P_{xy} \otimes \neg N_{xy}) \oplus (\neg P_{xy} \otimes N_{xy})]$  (3)
5. A proof of converse implication is analogical. **QED**

Two dependent nation states form the elementary cycle. It is conflict free cycle according to Theorem 3 in two cases: or both paths of the cycle are positive (example of synergism) or both of them are negative (example of antagonism). Conflict free state of every pair of nation states does not guarantee generally conflict free state of world system  $WS$  in whole.

**Theorem 4.** *In the world system  $WS$ , which is in a conflict state, every nation state is in a negative self-reference:  $(x)(y) C_{xy} \rightarrow N_{xx}$ .*

**Proof**

1.  $(x)(y) C_{xy}$  (the assumption of direct proof)
2.  $(x)(y) (P_{xy} \otimes N_{xy})$  (1, Definition 5)
3.  $(x)(y) (P_{xy} \otimes N_{yx})$  (2, symmetry of relation  $N_{xy}$ )
4.  $(x)(y) [(P_{xy} \otimes N_{yx}) \rightarrow N_{xx}]$  (a theorem of relation logic)
5.  $(x)N_{xx}$  (3, 4) **QED**

The Theorem 4 points to a distinctive attribute of a conflict state of the world system: each member of it is in a relation of negative feedback to itself.

**Theorem 5.** *In the world system  $WS$ , every nation state is in a positive self-reference:  $(x) P_{xx}$ .*

**Proof** ( $CPr$  — calculation of probability)

1.  $(Ex) \neg P_{xx}$  (the assumption of indirect proof)
2.  $(Ex) (N_{xx} \otimes IR_{xx})$  (1)
3.  $(Ex) [(Pr(x/x) \leq 0, 5) \otimes (Pr(x) > 0)]$  (1, 2,  $CP$ , Definition 2)
4.  $(Ex) [Pr(x/x) \leq 0, 5]$  (3)
5.  $(Ex) [Pr(x) > 0]$  (3)
6.  $(x) [\text{если } Pr(x) > 0, \text{ то } Pr(x/x) = 1]$  (a theorem of  $CPr$ )
7.  $(x) Pr(x/x) = 1$  (5, 6)
8. Contradiction (4, 7)
9.  $(x) P_{xx}$  (1, 8). **QED**

The Theorem 5 points to a distinctive attribute of a conflict free state of the world system: each member of it is in a relation of positive feedback to itself. Theorem 5 expresses a principal law of stable growth of nation states. To prosper, each of them should know how to maintain itself, to assert its concerns, to be in consistent relations with its friends and enemies.

**Theorem 6.** *The world system  $WS$  is in conflict free state then and only then,, when it does not contain any negative relation:  $(x)(y) (\neg N_{xy} \leftrightarrow \neg C_{xy})$ .*

**Proof**

1.  $(x)(y) \neg N_{xy}$  (the condition of Theorem 6)
2.  $(x)(y) \neg N_{yx}$  (1, symmetry of relation  $N_{xy}$ )
3.  $(x)(y) (\neg N_{xy} \otimes \neg N_{yx})$  (1, 2)
4.  $(x)(y) [(N_{xy} \otimes N_{yx}) \rightarrow P_{xx}]$  (a theorem of relation logic)
5.  $(x)(y) P_{xx}$  (3, 4)
6.  $(x) \neg N_{xx}$  (5, T 2)
7.  $(Ex)(Ey) C_{xy}$  (the assumption of indirect proof)
8.  $(Ex)(Ey) (N_{xy} \otimes P_{xy})$  (2, Definition 5)
9.  $(Ex)(Ey) [(N_{xy} \otimes P_{yx}) \rightarrow N_{xx}]$  (a theorem of relation logic)
10.  $(Ex) N_{xx}$  (8, 9)
11. Contradiction (6, 10)
12.  $(x)(y) \neg C_{xy}$  (7, 11)
13. A proof of converse implication is analogical. **QED**

The absence of negative relations in the world system according to Theorem 6 is necessary and sufficient for absence in it of a conflict state.

**Theorem 7.** *The world system  $WS$  is in conflict free state then and only then, when it contains only positive relations:  $(x)(y) (P_{xy} \leftrightarrow \neg C_{xy})$ .*

**Proof**

Follows from uniting Theorems 2 and 6. **QED**

The world system containing only positive relations is called a synergetic one.

**Theorem 8.** *The world system  $WS$  is in conflict state then and only then, when all nation states are not independent of each other:  $(x)(y) (C_{xy} \rightarrow \neg IR_{xy})$ .*

**Proof**

1.  $(x)(y) C_{xy}$  (the assumption of direct proof)
2.  $(x)(y) (N_{xy} \otimes P_{xy})$  (1, Definition 5)
3.  $(x)(y) [(N_{xy} \otimes P_{xy}) \rightarrow (N_{xy} \oplus P_{xy})]$  (a theorem of relation logic)
4.  $(x)(y) (N_{xy} \oplus P_{xy})$  (2, 3)
5.  $(x)(y) R_{xy}$  (4, Definition 4)
6.  $(x)(y) \neg IR_{xy}$  (5, Theorem 1). **QED**

According to Theorem 8 conflict is possible only between dependent nation states. Differently, dependence is a necessary condition of conflict. (It is obvious that the degree of conflict in the world system  $WS$  is proportional to the degree of mutual dependence of its nation states.)

**Theorem 9.** *The world system  $WS$  is in conflict free state, if it consists of independent nation states:  $(x)(y) (IR_{xy} \rightarrow \neg C_{xy})$ .*

**Proof**

Theorem 9 represents contraposition of Theorem 8. **QED**

Independence and the degree of conflict are incompatible properties of any given world system.

**Theorem 10.** *If every nation state of the world system  $WS$  is in a positive self-reference, then this system is in a conflict free state:  $(x)(y) (P_{xx} \rightarrow \neg C_{xy})$ .*

**Proof**

1.  $(x)P_{xx}$  (the condition of Theorem 10)
2.  $(Ex)(Ey) C_{xy}$  (the assumption of indirect proof)
3.  $(Ex)(Ey) (N_{xy} \otimes P_{xy})$  (3, Definition 5)
4.  $(Ex)(Ey) (N_{xy} \otimes P_{yx})$  (symmetry of relation  $P_{xy}$ )
5.  $(Ex)(Ey) [(N_{xy} \otimes P_{yx}) \rightarrow N_{xx}]$  (a theorem of relation logic)
6.  $(Ex) N_{xx}$  (4, 5)
7.  $(Ex) \neg P_{xx}$  (6, Theorem 2)
8. Contradiction (1, 7)
9.  $(x)(y) \neg C_{xy}$  (2, 8). **QED**

A positive self-reference is a sufficient attribute of a conflict free state for the world systems in which there exist both dependent, and independent nation states.

**Theorem 11.** *The world system WS is in conflict free state then and only then , when all nation states are dependent on each other and each of them is in a positive self-reference:  $(x)(y) [(P_{xx} \otimes R_{xy}) \leftrightarrow \neg C_{xy}]$ .*

**Proof**

1.  $(x)(y) (P_{xx} \otimes R_{xy})$  (the condition of Theorem 11)
2.  $(x)(y) [(P_{xx} \otimes R_{xy}) \rightarrow \neg C_{xy}]$  (Theorem 10)
3.  $\neg C_{xy}$  (1, 2)
4. A proof of converse implication is analogical. **QED**

For systems without the independent nation states a positive self-reference is a necessary and sufficient condition of a conflict free state.

**Theorem 12.** *If the world system WS is unipolar, then it is in conflict free state:  $(x)(y) (PL_{xy} \rightarrow \neg C_{xy})$ .*

**Proof**

1.  $(x)(y) PL_{xy}$  (the assumption of direct proof)
2.  $(x)(y) (P_{xy} \otimes \neg N_{xy})$  (1, Definition 6)
3.  $(x)(y) [(P_{xy} \otimes \neg N_{xy}) \rightarrow \neg C_{xy}]$  (a consequence of Theorems 6 and 7)
4.  $(x)(y) \neg C_{xy}$  (2, 3). **QED**

Absence of conflict is a necessary (but not sufficient) existence condition of a unipolar situation, i.e. synergetic systems.

**Theorem 13.** *If the world system WS is bipolar, then it is in a conflict free state:  $(x)(y) [(PL_x \oplus PL_y) \rightarrow \neg C_{xy}]$ .*

**Proof**

1.  $(x)(y) (PL_x \oplus PL_y)$  (the assumption of direct proof)
2.  $(x)(y) (N_{xy} \otimes \neg P_{xy})$  (1, Definition 7)
3.  $(x)(y) (N_{xy} \otimes N_{xy})$  (2, T 2)
4.  $(x)(y) (N_{xy} \otimes N_{xy}) \rightarrow P_{xy}$  (a theorem of relation logic)
5.  $(x)(y) P_{xy}$  (3, 4)
6.  $(x)(y) [P_{xy} \rightarrow (\neg N_{xx} \otimes P_{xx} \otimes \neg N_{yy} \otimes P_{yy})]$  (a theorem of relation logic)
7.  $(x)(y) (\neg N_{xx} \otimes P_{xx} \otimes \neg N_{yy} \otimes P_{yy})$  (5, 6)
8.  $(x)(y) [(\neg N_{xx} \otimes P_{xx} \otimes \neg N_{yy} \otimes P_{yy}) \rightarrow \neg C_{xy}]$  (a consequence of Theorems 6 and 7)
9.  $(x)(y) \neg C_{xy}$  (7, 8). **QED**

Absence of conflict is a necessary (but not sufficient) existence condition of a bipolar situation, i.e. antagonistic systems. This fact has the special significance, because conflict in ordinary usage is usually identified with antagonism.

**Theorem 14.** *If the world system of nation states WS is unipolar or bipolar, it is in a conflict free state:  $(x)(y) [(PL_{xy} \oplus (PL_x \oplus PL_y)) \rightarrow \neg C_{xy}]$ .*

**Proof**

Follows from uniting Theorem 12 and Theorem 13. **QED**

**Theorem 15.** *The world system WS is in conflict free state, only if it is unipolar or bipolar:  $(x)(y) [\neg C_{xy} \rightarrow (PL_{xy} \oplus (PL_x \oplus PL_y))]$ .*

**Proof**

1.  $(x)(y) \neg C_{xy}$  (the condition of Theorem 15)
2.  $(Ex)(Ey) \neg [PL_{xy} \oplus (PL_x \oplus PL_y)]$  (the assumption of indirect proof)
3.  $(Ex)(Ey) [\neg PL_{xy} \otimes \neg (PL_x \oplus PL_y)]$  (2)
4.  $(Ex)(Ey) [\neg (P_{xy} \otimes \neg N_{xy}) \otimes \neg (N_{xy} \otimes \neg P_{xy})]$  (3)
5.  $(Ex)(Ey) [(\neg P_{xy} \oplus N_{xy}) \otimes (\neg N_{xy} \oplus P_{xy})]$  (4)
6.  $(Ex)(Ey) [(N_{xy} \oplus N_{xy}) \otimes (P_{xy} \oplus P_{xy})]$  (5, Theorem 2)
7.  $(Ex)(Ey) (N_{xy} \otimes P_{xy})$  (6)
8.  $(Ex)(Ey) C_{xy}$  (7, Definition 5)
9. Contradiction (1, 8)
10.  $(x)(y) [PL_{xy} \oplus (PL_x \oplus PL_y)]$  (2, 9). **QED**

**Theorem 16.** *The world system WS is in a conflict free state, if and only if it is unipolar or bipolar:  $(x)(y) [(PL_{xy} \oplus (PL_x \oplus PL_y)) \leftrightarrow \neg C_{xy}]$ .*

**Proof**

Follows from uniting Theorems 14 and 15. **QED**

**Theorem 17.** *If the world system WS is bipolar, both poles face a Deterrence Dilemma :  $(x)(y)[(PL_x \oplus PL_y) \rightarrow (DD_x \otimes DD_y)]$ .*

**Proof**

1.  $(x)(y) (PL_x \oplus PL_y)$  (the condition of direct proof)
2.  $(x)(y) (N_{xy} \otimes \neg P_{xy})$  (1, Definition 7)
3.  $(x)(y) (N_{yx} \otimes \neg P_{yx})$  (2, symmetry of relations  $N_{xy}$  and  $P_{yx}$ )
4.  $(x)(y) (N_{xy} \otimes \neg P_{xy} \otimes N_{yx} \otimes \neg P_{yx})$  (2, 3)
5.  $(x)(y) (N_{xy} \otimes \neg P_{xy} \otimes N_{yx} \otimes \neg P_{yx}) \rightarrow (x)(y)(Et) (N_{xy} \otimes \neg P_{xy} \otimes N_{xt} \otimes \neg P_{xt} \otimes P_{yt} \otimes \neg N_{yt})$  (a theorem of relation logic)
6.  $(x)(y)(Et) (N_{xy} \otimes \neg P_{xy} \otimes N_{xt} \otimes \neg P_{xt} \otimes P_{yt} \otimes \neg N_{yt})$  (4, 5)
7.  $(x)(y) (DD_x \otimes DD_y)$  (6, Definition 8). **QED**

**Theorem 18.** *If the nation states of WS form a unipolar system, then their joint Position is a strict, strong equilibrium.*

**Proof**

1. The world system WS is unipolar (the condition of direct proof)
2. The world system WS does not face any dilemmas in drama theory sense (1, Definition 9)
3. The joint position of nation states of WS is a strict, strong equilibrium (2, Theorem 6 of drama theory (Howard 1999: A-12)). **QED**

### 3. Discussion of results

The phenomenon of polarization is complex in nature. Therefore its analysis has required first of all the definition of a set of elementary conceptual units, such as positive and negative relations, dependence and independence relations, conflict and conflict free states of a system.

It was established, that a necessary and sufficient condition of polarization of the world system WS is the resolution of its basic (i.e. encompassing all its members) conflict. The conflict state of WS testifies that it is in an unpolarized state. Consequently, only that world system is polarized, the basic conflict of that is resolved.

Polarization of the world system can lead to two, and only two outcomes, each of which designates a conflict free state overall viz.a unipolar or bipolar world system. Nevertheless both outcomes are not equal in their consequences. If a unipolar system arises, then all nation states are related to each other only positively. If a bipolar system arises, then all nation states are divided into two competing poles, in each of which all relations between the states are positive, while between these poles relations between the states are mutually negative. *The world system WS can not take any other form apart from these indicated conflict free states. The appearance of a world system with more than two poles or the absence of any poles as long-time and stable state of WS is impossible.*

A state of synergism of the members of WS will correspond to a unipolar world system. The synergism arises when all nation states are combined for a purpose that is significant for all the nation states. *Under such a polarization each nation state "loves" all others, recognizing them as its partners according to the rule: "a friend of my friend is my friend".* Due to this rule the unique pole of the world system consists only of "friends", i.e. it has neither internal nor external "enemies".

The unipolar world system is not only a synergetic one, but it does not face any dilemmas in the drama theoretic sense. This means that the nation states of such a world system possess a joint position which is a strict, strong equilibrium.

The synergism has following three relevant dynamic properties:

- The nation states being members of a synergetic system, simultaneously either everyone will progress, or everyone will regress.
- In the course of time and on condition that the generation of external power is unlimited, all synergetic systems only strengthen their synergism and tend to remain in conflict free state.
- A synergetic system ceases to exist only then, when the strengthening or weakening of some or all of the nation states becomes incompatible with maintaining universal "friendship".

A state of antagonism will correspond to a bipolar world system. Antagonism is developed then, when nation states are forced to be divided, because of the incompatibility of their relations to any significant purpose, into two opposite poles. In this case the relationships between the members of the different poles

are mutually "negative", and the relations of the nation states within each pole are only "positive". *Under such a polarization each nation state "loves" only "friends" and "hates" all "aliens", behaving itself according to all four rules: "a friend of my friend is my friend", "a friend of my enemy is my enemy", "an enemy of my friend is my enemy" and "an enemy of my enemy is my enemy".* According to these rules each pole consists only of "friends", each of which appreciates any member of an opposite pole as its "enemy".

Being structurally and dynamically a conflict free system, every bipolar (antagonistic) system is in a conflict state in the sense defined by drama theory. This takes place according to Theorem 17. Really, antagonism is a symmetrical relation of mutual confrontation in which both poles simultaneously neglect by threats each other and as result both face Deterrence Dilemmas. At the present time, synergism of the world system is impossible because of existence of deep cultural and possibly economic differences that put obstacles in the way of uniting tendencies.

This antagonism has the following three relevant dynamic properties:

- In antagonistic systems the progress of nation states belonging to one pole takes place at the expense of a regress of nation states belonging to another pole. This means that if one pole of an antagonistic system necessarily prospers, at the same time another degrades.

- In course of time and on condition that the generation of external power is unlimited, all antagonistic systems only strengthen the antagonism of their poles and tend to remain in a conflict free state.

- An antagonistic system ceases to exist only when the degrading pole is no longer capable of maintaining antagonism.

If we take into consideration that the positive and negative relations can vary depending on the extent that they are displayed, then the following new opportunities appear (Svetlov 2001: 171-181).

First, any pole of a synergetic or an antagonistic system can be partitioned into some subsets (underpoles), the members of which "love" each other, but have only "friendly" relationships with members of other subsets. Secondly, any synergetic or antagonistic system can without conflict coexist with any number of independent poles. Thirdly, a resolution of conflict is possible at which the competing poles of the system become completely independent from each other.

In other words, the multipolarity of world system *WS* is possible, but only as developing either synergism, or antagonism, or as a transformation of *WS* into a set of completely independent nation states. The first two possibilities do not deduce us [lead out??] for frontier points of unipolarity and bipolarity. The third possibility is completely excluded by the existing globalization tendencies of world economics and policies. Hence, the everyday belief of politicians that the multipolarity of the world system is a long-term possibility with three or more harmonically or destructively interacting poles is impossible solely for internal system reasons. *In other words, such a belief expresses a popular but false political myth.* Continuous oscillating of the world system between two and only two balanced states - unipolarity (synergism) and bipolarity (antagonism) - or its move from one form of bipolarity to another (for example, from an ideological confrontation to civilizational, as Huntington predicted) is the only admissible general scenario for the development of world politics. The cause of such limited oscillations is, apparently, irremovable ethnocentrism – such a "view of things in which one's own group is the center of everything, and all others are scaled and rated with reference of it" (Sumner 1907: 13). Exceptionally, ethnocentrism (political, religious, ideological, cultural or domestic) promotes survival and self-conservation which serves a general cause of partitioning all actors into "friends" and "enemies" and subsequently of unifying and differentiating.

If we take into account the present sharp weakening of the role of ideology and the strengthening of the influence of culture on the processes of civilization this perspective on the problem of polarization as represented here corresponds well with the Huntington's conjecture. As this paper has shown, his forecast has a formal justification.

## REFERENCES

- BENNETT, P. 1998. "Confrontation analysis as a diagnostic tool", *European Journal of Operational Research*, **109**, 465-482.  
 BRYANT, J. 2003. The six dilemmas of collaboration. Inter-organizational relationships as drama. John Wiley & Sons Ltd.  
 BRZEZINSKI, Zb. 1993. Out of control: global turmoil on the eve of the twenty-first century. New York: Scribner.  
 FUKUYAMA, F. 1995. "The end of history, five years later", *History and Theory*, **34**, 27-43.  
 HOWARD, N. 1999. Confrontational analysis. How to win operations other than war. CCRP Publications: Vienna, VA.

- HUNTINGTON, S. 2003. Clash of civilizations. Moscow (Russian translation).
- NORTHROP, F. 1947. The meeting of east and west: an inquiry concerning world understanding. New York: Macmillan.
- SVETLOV, V. 2001. The analytics of conflict. St.-Petersburg (In Russian).
- SUMNER, W. 1907. Folkways. A study of sociological importance of usages, manners, customs, mores and morals. Boston.
- WALTZ, K 1993. "The emerging structure of world politics", *World Security*, **18**, 44-79.