Chapter 9
Reflexive Control

Reflexive control is a way to influence subjects that inclines them to make decisions predetermined by the controlling party (Lefebvre, 1965, 1967; Taran, Shemaev, 2004). Within the framework of our model, any influence on a subject or a group of subjects can be considered reflexive control. We distinguish four types of reflexive control:

– manipulation by influence;
– manipulation by changing relations;
– manipulating by order of significance (possible only if the group's graph is not decomposable);
– influence over a subject's inner domain without the subject's knowledge.

In this chapter, we will assume that each subject chooses an alternative from set {0, 1}.

9.1. Manipulation by influence

First, we will consider *direct* influence. Here is the form of such influence:

a wants b to choose x and exerts influence x.

Consider the graph of relations (Fig. 9.1.1):

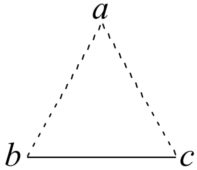

Fig. 9.1.1. Graph of relations

It corresponds to the polynomial

$$a + bc \tag{9.1.1}$$

and to the diagonal form

$$\begin{array}{ccc} & & [b]\,[c] \\ & [a] + [bc] & \\ [a + bc] & & . \end{array} \tag{9.1.2}$$

After transformation, we see that this form is equivalent to the polynomial (9.1.1.). The equation for subject b can be written:

$$b = a + bc \tag{9.1.3}$$

or

$$b = (a + c)b + a\overline{b}\ ; \tag{9.1.4}$$

$$A = a + c,\ B = a,\ A \supseteq B\ ,$$

hence, all values of b from the interval

$$(a + c) \supseteq b \supseteq a \tag{9.1.5}$$

are solutions to (9.1.4).

When $c = 0$,

$$a \supseteq b \supseteq a\ , \tag{9.1.6}$$

thus,

$$b = a. \tag{9.1.7}$$

If a wants b to choose 1, a's influence on b must be 1; if a wants b to choose 0, a's influence on b must be 0.

When $c = 1$,

$$1 \supseteq b \supseteq a\ . \tag{9.1.8}$$

If $a = 1$, then $b = 1$, i.e., b obeys a's requirement. If $a = 0$, then b has freedom of choice and will not necessarily obey a. Thus a can incline b to choose 1, but cannot make him choose 0.

Consider reverse influence, when a subject chooses the alternative opposite to the one another subject inclines him. Here is the form of such influence:

> a wants b to choose x, but to achieve this a must exert influence $\overline{x}$.

Let the graph of relations be as follows (Fig.9.1.2):

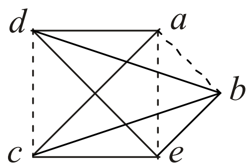

Fig. 9.1.2. Graph of relations

This graph is decomposable; it corresponds to the polynomial (9.1.9)

$$(c + d)\,(a + be), \tag{9.1.9}$$

and the diagonal form (9.1.10),

$$[b]\,[e]$$
$$[c] + [d] \qquad [a] + [be]$$
$$[c + d] \qquad [a + be]$$
$$[(c + d)\,(a + be)] \quad . \tag{9.1.10}$$

After transformation, we obtain the equation for b (9.1.11):

$$b = c + d + \overline{a}(\overline{b} + \overline{e})\,. \tag{9.1.11}$$

If $c = 0$, $d = 0$ and $e = 0$, then b's choice is given by the function

$$b = \overline{a}\ . \tag{9.1.12}$$

Therefore, within the framework of our model, reverse reflexive control is possible.

Let us raise a question: is it possible to influence a subject such that he moves into the state of free choice? Here is the form of such influence:

> a wants b to have freedom of choice and exerts influence x.

Consider the graph in Fig. 9.1.1. Subject b corresponds to equation (9.1.3). Let $c = 1$, and let a incline b to choose 0. As a result we obtain the equation

$$b = b. \qquad (9.1.13)$$

This equation has two solutions: $b = 1$ and $b = 0$. Thus, by inclining b to choose 0, a moves him into a state of free choice. If a inclines b to choose 1, b chooses 1 and does not have the freedom of choice.

In the above example the controlling subject inclines the controlled subject to choose 0, in order to move him into a state of free choice. We will demonstrate now that there is also a case where the subject moves into a state of free choice after being pushed toward 1. Consider again the graph in Fig.9.1.1. Let c exercise reflexive control over b instead of a. In this case we will also have equation (9.1.3). For $a = 0$,

$$b = bc. \qquad (9.1.14)$$

If the controlling subject c pushes b toward choosing 1,

$$b = b, \qquad (9.1.15)$$

i.e., subject b acquires freedom of choice.

Let us consider the situation of a subject in the state of *frustration* and unable to make a decision. This happens when the equation corresponding to the subject does not have a solution. Here is the form:

> a wants b to become incapable of making a choice and exerts influence x.

A group corresponds to the graph in Fig. 5.1.1. We write the equation for b, assuming that $x = b$ in (5.1.2):

$$b = e + d + \bar{c}(\bar{a} + \bar{b}) . \qquad (9.1.16)$$

Let $e = 0$, $d = 0$, $c = 0$; then

$$b = \bar{a} + \bar{b} . \qquad (9.1.17)$$

If subject a influences b to choose 1, the equation will be

$$b = \bar{b} , \qquad (9.1.18)$$

thus, b is in a state of frustration.

It is possible that subject b moves into a state of frustration after being pushed toward 0. Let the relations graph be as follows:

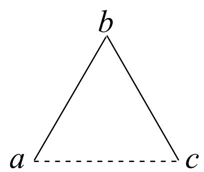

Fig. 9.1.3. Graph of relations

This graph corresponds to the polynomial

$$b\,(a + c), \qquad (9.1.19)$$

and the diagonal form

$$\begin{array}{ccc} & & [a] + [c] \\ & [b]\,[a + c] & \\ [b\,(a + c)] & & \end{array} , \qquad (9.1.20)$$

and the equation for b is

$$b = b\,(a + c) + \bar{b} . \qquad (9.1.21)$$

If $c = 0$,

$$b = ba + \bar{b} . \qquad (9.1.22)$$

To move b into a state of frustration, a must incline b toward choosing 0, which leads to equation (9.1.18).

Consider the case in which a group of two subjects, a and c, controls subject b. Here is the first schema:

> a and c want b to choose x; to achieve this is a inclines b to choose y, and c incline b to choose z.

Construct the following graph (Fig. 9.1.4):

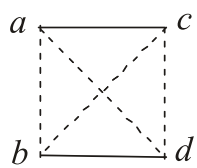

Fig. 9.1.4. Graph of relations

This graph corresponds to the polynomial

$$ac + bd, \tag{9.1.23}$$

and the diagonal form

$$\begin{array}{ccccc} & & [a]\,[c] & & [b]\,[d] \\ & [ac] & & +\,[bd] & \\ [ac + bd] & & & & , \end{array} \tag{9.1.24}$$

and the equation for b is

$$b = ac + bd\ . \tag{9.1.25}$$

Let $d = 0$; then

$$b = ac. \tag{9.1.26}$$

We see that, in this example, b's choice is predetermined by a and c. If at least one of them pushes b toward 0, b will choose 0; if both of them, a and c, incline b toward 1, b will choose 1.

Here is the second schema:

> a and c want b to have the freedom of choice; to accomplish this, a exerts influence x, and c exerts influence y.

Consider the graph in Fig. 9.1.1. Equation (9.1.3) corresponds to b. To give b the freedom of choice, a must push b toward choosing 0, and c must push b toward 1.

Let us note that, in our model, subjects cannot push other subjects toward states of frustration or freedom of choice. They can only incline a subject toward choosing one or another alternative such that the subject moves into a predetermined state. If a subject is superactive, manipulation by influence is ineffective, since under any set of influences the subject chooses alternative 1.

9.2. Manipulation by changing relations

The main feature of this type of reflexive control is that the graph of relations is modified by the controlling subject. It is important to note that such modification may affect the choices of other subjects as well.

We single out two types of manipulation. In the first type, controlling subject a changes the relation (a, b), in the second, a leaves the group.
Here is the form of this manipulation:

> a wants b to obtain freedom of choice and so modifies the relation (a, b).

The initial graph of relations is given in Fig.9.2.1:

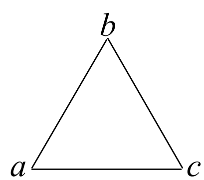

Fig. 9.2.1. Graph of relations

It corresponds to the polynomial

$$a\,b\,c \tag{9.2.1}$$

and the diagonal form

$$[a\ b\ c]^{[a]\,[b]\,[c]} \equiv 1. \tag{9.2.2}$$

This group is superactive. Thus, b chooses only 1. The graph does not allow b to obtain the freedom of choice due to any modification of influence by other subjects.

What will happen if a changes the relation $(a,\ b)$ from cooperation to conflict (Fig. 9.2.2)?

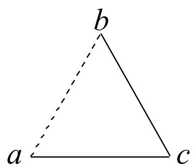

Fig. 9.2.2. Graph of relations after change in relation $(a,\ b)$

This new graph corresponds to the polynomial

$$c\,(a + b), \tag{9.2.3}$$

and the diagonal form

$$[c\ (a + b)]^{[c]\,[a + b]^{[a] + [b]}}, \tag{9.2.4}$$

and the equation for b is

$$b = b + a + \overline{c}\ . \tag{9.2.5}$$

For $a = 0$ and $c = 1$, the equation becomes

$$b = b. \tag{9.2.6}$$

With the given values of a and c, subject b has freedom of choice. Therefore, after the relation has changed, b is able to obtain freedom of choice.
Consider the following schema:

> a wants b to lose the possibility of obtaining freedom of choice and changes the relation (a, b).

Let the initial situation be depicted by the graph in Fig.9.2.2. Subject a changes the relation (a, b) from conflict to cooperation. As a result, the new situation corresponds to the graph in Fig. 9.2.1. Subject b becomes superactive and loses the possibility to have freedom of choice.

We have demonstrated in Chapter 8 that a group corresponding to the graph in Fig.8.2.2 is superactive, i.e., every subject in the group can choose only 1.

Consider the following schema:

> a wants c to be able to have freedom of choice and, to achieve this, a leaves the group.

As a result, the graph of relations changes to the one in Fig. 8.2.1. This graph corresponds to the diagonal form (8.2.2), and the equation for c is

$$c = cd + ef. \tag{9.2.7}$$

We see that after a leaves the group, c can have freedom of choice, for example, if $d = 1$ and $e = 0$.

9.3. Manipulation by order of subjects' significance

When a graph of relation is not decomposable, the subject ranks other subjects by order of significance and removes them one by one, starting from the least significant, until the graph becomes decomposable. When a manipulates b's ranking of others' significance, there is the danger of becoming so insignificant for b

that *b* removes *a*, that is, *b* would cease to notice *a*. To avoid this, *a* has to be careful to remain in the graph.

Consider an example. A graph of relations is as follows (Fig. 9.3.1):

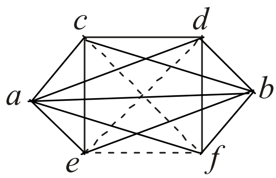

Fig. 9.3.1. Non-decomposable graph

This graph is not decomposable, because it contains subgraph $S_{(4)}$: <*e*, *c*, *d*, *f*>. The order of significance for subject *b* is *c*, *d*, *f*, *e*, *a*. The first subject removed is *a*. The resulting graph <*b*, *c*, *d*, *e*, *f*> is not decomposable either, because it contains the same subgraph $S_{(4)}$: <*e*, *c*, *d*, *f*>. The next subject removed is *e*, resulting in a new graph that is decomposable (Fig.9.3.2):

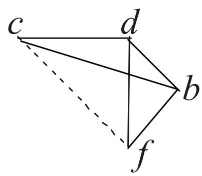

Fig. 9.3.2. Decomposable graph

This graph corresponds to the polynomial

$$b\,d\,(c+f), \qquad (9.3.1)$$

and the diagonal form

$$\begin{array}{lll} & & [c]\ + [f] \\ & [b]\,[d]\,[c+f] & \\ [b\,d\,(c+f)] & & . \end{array} \qquad (9.3.2)$$

and the equation for b is

$$b = c + f + \overline{b} + \overline{d} \tag{9.3.3}$$

or

$$b = (c + f + \overline{d})b + \overline{b} \ . \tag{9.3.4}$$

Equation (9.3.4) has a solution if

$$(c + f + \overline{d}) \supseteq b \supseteq 1 \ . \tag{9.3.5}$$

It follows from (9.3.5) that equation (9.3.4) has a solution only under the condition that $c + f + \overline{d} = 1$. This solution is $b = 1$. When $c + f + \overline{d} = 0$, equation (9.3.4) does not have a solution, and subject b is in a state of frustration.

In (9.3.5), there is no variable corresponding to subject a, thus b's ability to make a choice does not depend on a. But a can avoid being removed.

The schema is as follows:

a does not want to be removed from b's graph and so changes the order of other subjects' significance for b.

Let a change b's order of significance to the following: c, d, e, a, f. Now, subject a occupies the second to last place and subject f occupies the last place. The least significant for b is f, so, b removes f. As a result, the graph in Fig.9.3.1 changes to the graph in Fig.9.3.3:

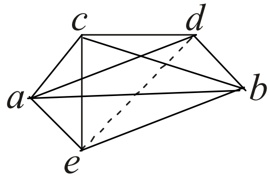

Fig. 9.3.3. Graph of relations after removing subject f

This graph is decomposable. It corresponds to the polynomial

$$a\,b\,c\,(e+d), \tag{9.3.6}$$

and the diagonal form

$$[a\,b\,c\,(e+d)]^{[a]\,[b]\,[c]\,[e+d]^{[e]+[d]}}, \tag{9.3.7}$$

and the equation for b is

$$b = e + d + \overline{a} + \overline{b} + \overline{c} \tag{9.3.8}$$

or

$$b = (e + d + \overline{a} + \overline{c})b + \overline{b}\,, \tag{9.3.9}$$

which contains the variable a, such that subject a can influence b's choice. This equation has a solution if

$$e + d + \overline{a} + \overline{c} = 1\,. \tag{9.3.10}$$

In this case $b = 1$. We see that by inclining b to choose 0, subject a eliminates the case in which b would not be able to make a choice.

9.4. Reflexive control by subconsciousness influence

Consider now the case of unconscious influence (see Chapter 6). There is a group of two subjects a and b in conflict between themselves. Its diagonal form is

$$[a+b]^{[a]+[b]}\,. \tag{9.4.1}$$

We endow b with a subconscious by regarding the letters a on the first and second tiers as independent variables: a_1 is a's unconscious influence on b, and a_2 is the influence of which b is aware. Subject b corresponds to equation

$$b = [a_1 + b]^{[a_2 + b]} . \tag{9.4.2}$$

Here is the schema:

> *a* wants *b* to have freedom of choice

To achieve this goal, *a* exercises influence on both the conscious and subconscious levels. At the subconscious level, *a* inclines *b* to choose 0; *b* is not aware of this ($a_1 = 0$). At the conscious level, *a* inclines *b* to choose 1, and *b* is aware of it ($a_2 = 1$). Substitute these values into (9.4.2) and we find that

$$b = [0 + b]^{[1 + b]} = b , \tag{9.4.3}$$

that is, subject *b* has freedom of choice.