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THE TYPES OF INCONGRUITY AND PAULOS'S MODEL

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In this paper some of the characteristics of Paulos's model of humor are examined. The part of the joke path on which incongruity resolution is performed is determined in detail. It is suggested to be an interpretation of the movement on the bottom layer on the behavioral surface as well as an interpretation of the jump from the bottom to the top layer. Finally a rough draft of the story path of an incongruity whose resolution doesn't cause a change in excitation was made.

Keywords: incongruity, catastrophe theory, Paulos's model of humor, humor, negative emotions, learning.

1. INTRODUCTION

As a rule, the theories of humor are partially dealing with the phenomenon of humor. There is incongruity-resolution theory (Suls, 1972) that explains humor as a result of incongruity resolution. There are a number of theories that deal with incongruity as the main element of humor as well as a number of theories that deal with special types of incongruity. There are theories that explain humor as a result of relief that follows after incongruity resolution etc. For the difference between the majority of humor theories, Paulos's model of humor (1980) describes the phenomenon of humor as a whole (Tkalac, 2000). Although the model is a qualitative one (to accurately measure independent variables is very difficult) or as the author says the model is a suggestive mathematical metaphor of the humor phenomenon, I believe that the model deserve our attention.

Apart from the significance that the model have for an understanding of the humor phenomenon, it seems that it could be also useful in the modelling of some related processes such as the as generation of negative emotions and learning. The relation between the tree phenomena could be important because it enables us to try to apply the observations from one to the other.

The movement on the top layer of the behavioral surface of Paulos's model is interesting for the phenomenon of humor. By passing on the bottom layer a joke is finished. For understanding the phenomenon of humor it is interesting to see the part of the joke path on which incongruity resolution is performed. In this paper we will try to determine the part of the joke path on which the process is performed.

Since it is not clear what the moving on bottom layer of behavioral surface represents, we will try to find an interpretation of the movement on the bottom layer as well as an interpretation of the jump from the bottom to the top layer.

And finally, there is a class of incongruity whose resolution doesn't cause a change in physiological or psychological excitation. In this paper we will try to determine a representation of the path of the story that contains such an incongruity.

1.1. Paulos's three-dimensional model of humor

The topological theory, known as the theory of catastrophe that was developed by Rene Thom (1975), deals with the description and classification of discontinuities. The theory was successfully applied to a number of processes in the biological and social sciences (Thom, 1975; Zeeman, 1972, 1976 etc.).

Paulos (1980) applied catastrophe theory on humor. Among the few models of humor that Paulos developed, his three-dimensional model is probable the most successful. Here we will briefly describe Paulos's model of humor.

For any process, that can be described with two independents (x,y) and one dependent variable (z), generally it is valid **z=f(x,y)**. If every ordered pair of independent variables value (x,y) is mapped onto the corresponding (the most likely) value of the dependent variable z, we will have a surface with a three-dimensional space. According to Thom's main theorem, the surface must have a general shape, as shown in figure 1, for any process that satisfies the following conditions:

- depends on two independent variables (x,y),
- has discontinuity,
- the value of dependent variable (z) is the most likely value associated with the ordered pair of values of variables x, y , and
- the function expressing the likelihood that an arbitrary value of z will be associated with an arbitrary ordered pair of the value (x,y), has to be a 'smooth' function.

The surface on figure 1 is a so called surface of behavior. As one can see, in the middle of the diagram the surface is folded so that there are three layers. As we approach the starting point of the coordinate system, the triple layer is progressively narrowing to a point. Outside the region of the triple-layer, the ordered pair x,y are mapping onto one of the correspondent values of the variable z. Theoretically, inside the region, an ordered pair can be mapped onto the top, middle or bottom layer.

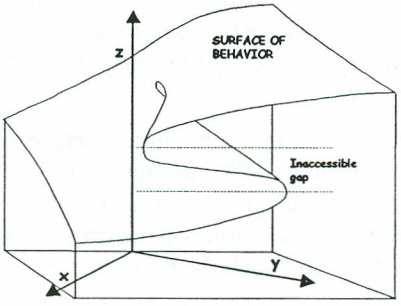

Figure 1. Surface of behavior on Paulos's three-dimensional model of humor

However, the mapping onto the middle layer is the least likely mapping (i.e. the middle layer is inaccessible). A possible mapping onto the top and bottom layer is what you have left.

The independent variables x and y are interpreted by as a Paulo measure of the development of the first interpretation of the story (that precedes the punch line of a joke) and the second interpretation of the story and the punch line together, respectively. In other words, depending on the value of independent variables, it is possible to have the first or the second interpretation of a story. To have both interpretations at the same time would correspond to the location on the middle layer of the surface. As this layer is inaccessible, it is not possible (figure 2). For a dependent variable z, Paulos suggested that it is interpreted as a measure of physiological excitement or tension

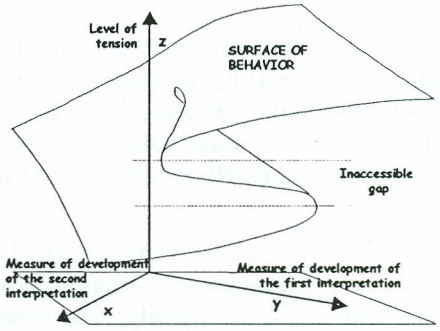

Figure 2. Interpretation of the variables in Paulos's model of humor

In Paulos's three-dimensional model of humor, the phenomenon of humor is represented by a curve (joke path) that switches from the top to the bottom layer of the surface (figure 3). As the story develops, the perceiver uses the information from the story to formulate an interpretation. At a given moment the narrator uncovers the punch line. Additional information contained in the punch line introduce incongruity and causes a sudden, catastrophic switch from the first to the second interpretation.

Every interpretation of the story corresponds with a given level of physiological and psychological tension. The phenomenon of humor is a consequence of the switch from a high level of tension to a low level of tension. The exchange of interpretation has to be sudden and complete. In the model the exchange is represented as a fall from the top to the bottom layer of the surface.

1.2. The procedure of logical resolution in Paulos's model

A laugh, as a sign that a resolution has finished and that we have understood the joke, follows (if at all) shortly after the punch line. However, apart from the short time of execution, it seems that the resolution is a complex process (Suls, 1972).

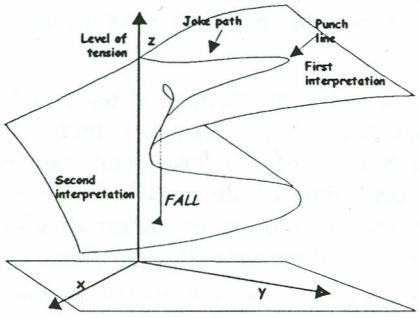

Figure 3. Joke path in Paulos's three-dimensional model of humor

A story, that proceeds to the punch line of a joke, contains the first element of incongruity. The first interpretation of the story is adapted to the first element of incongruity. The punch line introduces the second element of incongruity. The interpretation that was in the meantime consistent, afterwards then contains incongruity. As a result of this incongruity resolution, the second interpretation does not contain incongruity.

It could be interesting to ask which part of the story path in Paulos's model the logical resolution of incongruity is performed on. The process of incongruity resolution started with the appearance of incongruity, i.e. with the information contained in the punch line. As a consequence of the punch line, the story path abruptly changes its direction (figure 4). A consequence of the logical resolution of incongruity is the switch to the second interpretation (i.e. a fall on the bottom layer of the surface). The process of resolution is performed between two the points:

- a sudden change of story path direction and
- the outcome on the edge of the top layer (i.e. the point at which this fall drop immediately follows).

1.3. Types of incongruity

Morreall (1987) has shown that the reaction on incongruity can significantly differentiate. On the basis of this reaction, he defined three classes:

- Incongruity whose resolution is followed by humor,
- Incongruity whose resolution is followed by so called negative emotions (fear, hate, disgust, aversion etc.) and
- Incongruity whose resolution is followed by reality assimilation (explaining and memorizing the new relation between the concepts in the meantime we will assume they were incongruent).

We will illustrate the classes of incongruity with the following examples. The examples are constructed according to Ziv (1984).

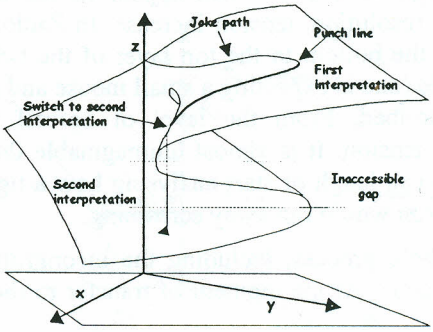

Figure 4. Part of the joke path in Paulos's model, on which the logical resolution of incongruity is performed

An incongruity whose resolution is followed by the phenomenon of humor can be illustrated by our next example: Let's say we believe that a very hungry tiger is waiting in our kitchen. We pluck up enough courage to open the door and we see a mouse. As the picture essentially differentiates from what we expected, never we are dealing with incongruity[1]. The reaction one can expect is relief and eventually the phenomenon of humor.

An example for a incongruity that has a resolution that provokes a negative emotion can be illustrated by the next example: Let's say we hear a mouse squeaking in the next room. When we open the door we see a tiger ready to attack us. Emotionally the example the direct opposite of the previous one. Again, we have an incongruity but the reaction one can expect is fear. One would be frightened and would run away as fast as possible (at least I would do that).

As an illustration of incongruity whose resolution is followed by reality assimilation, we will use an example that is similar to the one used in almost every textbook that deals with an introduction to artificial intelligence. We are open the door of a bedroom and instead of bedroom, we see a donkey eating grass. Again we have incongruity. Somebody expecting to see a bedroom and looking at a donkey will probably be surprised and will try to understand what has happened. Essentially this is what Morreall understood under the reality assimilation.

Now let us look how we can represent these three types of incongruity in Paulos's model. As we have already seen, humor appears as a consequence of the transfer to a lower level of tension. In the graphical representation of Paulos's model, it will happen when, as a consequence of the logical resolution of incongruity, the story path falls from the top (the higher level of tension) to the bottom layer of the behavioral surface (the lower level of tension). The first example (one is expecting a tiger in the kitchen and see a little mouse instead) is describing this type of transformation of tension.

[1] According to a definition of incongruity, 'What you expect is not what you get'.

In accordance with this negative emotion will appear in the case when, as a consequence of the incongruity resolution, tension increase. In Paulos's model it can be represented as a jump from the bottom to the top layer of the behavioral surface (figure 5). In the second example (one is expecting a small mouse and sees a tiger) this kind of transformation is described. From the level of normal tension, one is transferred to the level of high tension. It is almost unimaginable that as a result of such a transfer a normal person can laugh or start analysing how a tiger has appeared in the kitchen. A reasonable person would run away screaming.

It is interesting that the whole process, including the incongruity resolution, is performed on a low level of tension. At the moment of transfer to the high level, the process is then completed.

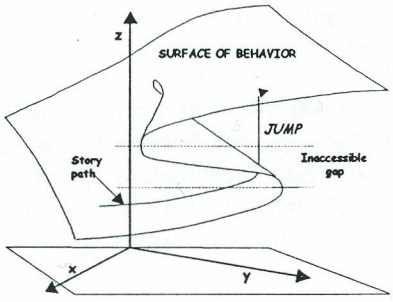

Figure 5. Jump from the bottom to the top layer of the behavioral surface in Paulos's model

Reality assimilation follows layers that switch when both interpretations of the story are on approximately an equal level of tension. Under this condition, according to Morreall, curiosity will appear and one will try to find some explanation for the relationship between the concepts, in the meantime the are believed to be incongruous, and are built into one's knowledge base.

As we assumed, this change in the level of tension is proportional to the gap between top and bottom layer of the behavioral surface so we have two possibilities:

- the folding of the surface is minimal (transfer to the other interpretation is performed near the starting point of the coordinate system) or
- the difference in the level of tension between layers can be neglected.

Let's look at what will happen if the story that proceeds to the punch line is finished near the starting point of Paulos's model. Near to the starting point of the coordinate system the folding of the surface is negligible. The story path will appear in the same way it is presented in figure 6.

As an example of reality assimilation, Morreall uses the well-known cartoon of Charles Addams. In the cartoon, one can see a skier. Ski tracks are on different sides of the tree. It seems that when the cartoon appeared for the first time a number of readers tried to explain how this could have been possible. Instead of thinking it was just a joke they tried to solve the problem.

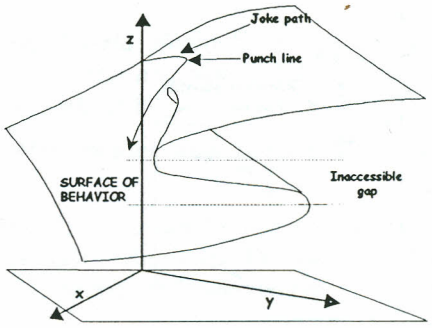

Figure 6. Transfer to the other interpretation could be performed near the starting point of the coordinate system

Actually every time the punch line is told out too soon (and ruins the joke), instead of humor, if we are lucky, we will provoke curiosity and an attempt to explain the incongruity.

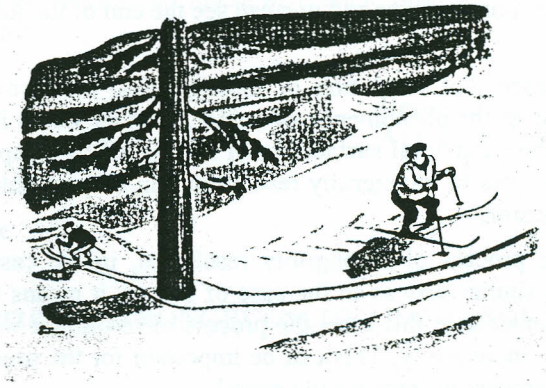

Figure 7. An example of reality assimilation

The second possibility is that the difference in the level of tension between layers can be neglected. On Paulos's model one can represent this situation in the way shown in figure 8.

This case will correspond to the example in which we open a bedroom door and find ourselves in front of a donkey. This example is emotionally neutral. I cant imagine anybody expecting to see a bedroom and when they donkey they'd start to shake. One would probably try to interpret how this could happen.

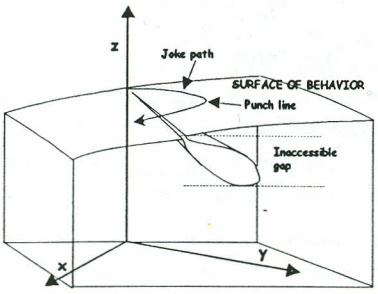

Figure 8. The difference in the level of tension between layers can be neglected

2. CONCLUSION

In the case of humor, the story path is performed almost completely on the top layer of the behavioral surface on the high level of tension. The process of the logical resolution of incongruity starts with the introduction of the second element of incongruity. Switch to the bottom layer and one can see the end of the joke at the same time.

It seems that the process of resolution of incongruities, that provoke negative emotions, is the inversion of the phenomenon of humor. In other words it is performed on the bottom layer of the behavioral surface and it is finished by jumping to the top layer. In this case the process of incongruity resolution will be performed on the low level of psychological tension.

If it is true that the process of incongruity resolution, in the case of negative emotions, performs in a similar way as in the case of humor, it means that it doesn't depend on the level of tension. In this case, the process of resolution will be initiated by the appearance of the incongruity. This can be important for the process of reality assimilation, e.i. for the process of learning in general.

The phenomenon of reality assimilation in principle is similar to the preceding two phenomenons. The essential difference in the relation to them is that a switch to the second interpretation is not accompanied by a change in tension. As it is emotionally neutral, incongruity provokes embarrassment and curiosity.

A narrow connection between the phenomenon of humor and negative emotions, and especially between the phenomenon of humor and reality assimilation, makes it clear that Paulos's model of humor is really important.

Reality assimilation is one of the fundamental models of learning. It seems that the humor observation of an incongruity the process of incongruity resolution is induced. It would be interesting to examine the role of the definition of the incongruity elements (i.e. the definition of the problem within the process of learning).

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TIPOVI INKONGRUENCIJE I PAULOSOV MODEL

Sažetak

U radu su ispitane neke karakteristike Paulosovog modela humora. Pobliže je određen dio putanje priče vica na kojem se odvija proces logičkog razrješenja vica. Predložena je interpretacija kretanja po donjem sloju površne ponašanja kao i interpretacija skoka s donjeg na gornji sloj. I na kraju, skicirana je putanja priče koja sadrži inkongruenciju kod čijeg razrješavanja ne dolazi do promjene psihičke napetosti.

Ključne riječi: inkongruencija, teorija katastrofe, Paulosov model humora, humor, negativne emocije, učenje.