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**AN EXPLANATION OF HUMOUR BY THE PRINCIPLES
OF THE ASSOCIATIVE S-R THEORY OF REINFORCEMENT**

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Abstract

Pleasure experienced in humour is not simply reinforcement due to performing a reaction followed by drive reduction. Gratification in humour is, primarily, in not performing a reaction that is not followed by reinforcement. At the operational level, humour is a close contact of two distinct, interfering reactions (humour as intervening variable). Deductive coverage of this empirical law by a broader theory is achieved by subsuming the contiguity of two reactions into a form of dissipation of reactive inhibition. This is also the main hypothesis of this work: humour is gratification caused by sudden dissipation of reactive inhibition (humour as hypothetical construct). According to Hull [6; 7; 8], each performed reaction leaves behind reactive inhibition – a striving not to be repeated. This striving is an unpleasant state, similar to fatigue, so that removing it represents reinforcement, pleasure. The contiguity of two different reactions (R_1 and R_2), i.e. the quick sequence of R_1 and R_2 , is a form of realization of the striving for R_1 not to recur, that is, dissipation of reactive inhibition of the reaction R_1 . In other words, R_2 is a sudden rest from R_1 . The quicker the sequence of R_1 and R_2 , the stronger is ‘the rest effect’. This is because reactive inhibition is caught at the very end of R_1 , at its maximum, and therefore sudden dissipation of such big amount of reactive inhibition is more reinforcing. A mechanism of putting R_1 and R_2 closer together is the association (of contiguity, similarity or contrast) through which a connection, i.e. mediation of R_1 and R_2 is achieved. Based on our main hypothesis, humor can be divided with regard to presence, i.e. absence of the mediating reaction. A type of humor which includes the mediating reaction, i.e. association, is wit (catchword, raciness), while the other type without the association is comedy (comics).

Key words: humour; reinforcement; reactive inhibition; association; mediation.

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**ЮМОР: ОБЪЯСНЕНИЕ С ПОМОЩЬЮ ПРИНЦИПОВ S-R ТЕОРИИ
ПОДКРЕПЛЕНИЯ**

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Аннотация

Гипотеза, изложенная в статье, опирается на принятое в психологии разделение понятия „подкрепление“ на положительное и отрицательное и состоит в том, что удовольствие, которое приносит юмор, заключается не в положительном подкреплении после осуществления реакции с последующей редукцией эмоционального порыва, но в первую очередь, в неисполнении реакции, которая не сопровождается подкреплением (отрицательное подкрепление). Гипотеза представлена в статье последовательно: во-первых, на операционном уровне показывается, что юмор является тесным контактом двух различных интерферирующих реакций (юмор в качестве промежуточной переменной). Затем демонстрируется, каким образом структуру этого явления (соприкосновения двух реакций) можно рассматривать в качестве модели диссипации реактивного торможения (ингибиции), а рассыпание реактивного торможения является своего рода отрицательным подкреплением. Согласно Халлу [6; 7; 8], каждая осуществленная реакция

оставляет за собой реактивное торможение – стремление к ее неповторению. Это переживается как неприятное состояние, которое похоже на усталость, а уклонение от такого состояния является подкреплением. Близость двух различных реакций (R_1 и R_2), то есть быстрая смена R_2 на R_1 представляет собой осуществление желания, чтобы R_1 не повторилось, то есть рассыпание реактивного торможения реакции R_1 . Другими словами, R_2 создает резкий разрыв от R_1 . Чем быстрее последовательность R_1 и R_2 , тем эффект сильнее, поскольку реактивное торможение схвачено на самом конце R_1 когда оно максимальное, и когда рассыпание сильнее. Для сближения R_1 и R_2 используется ассоциация (примыкание, сходство или контраст) в качестве связывающего фактора R_1 и R_2 , или медиатор (посредник). В статье предложено деление юмора по наличию или отсутствию посредничества.

Ключевые слова: юмор; подкрепление; реактивное торможение; ассоциация; посредничество.

Introduction

This work represents an attempt to explain humour by the principles of classical behavior theories of learning, more precisely, the associative S-R theory of reinforcement. We will use *humour* as the highest genus concept for any phenomenon that contains a reaction of laughter. We will leave aside all previous divisions of funny entities that include joke, sally, aphorism, comic, humour, gallows humour, burlesque, humoresque etc. Such decision is normative and plausible, and is a result of realization that we still do not have the highest genus concept of funny, but we do have various divisions (psychoanalytic, literary, and conventional). In other words, there are classes, but there is no genus. Starting from the main hypothesis of this work, we will form a new classification based on a unique principle.

At the beginning of explanation (development of axiomatic system), we need to point to two basic judgements that are generally accepted as true and are so evident that we can freely consider them as facts, or even as axioms. These judgements are:

- 1) *Humour is a pleasure* and
- 2) *Humour is a surprise*.

Obviously, there exists an intersubjective (interpersonal) agreement on the truthfulness of these two stands. In the literature on humour, the second stance (surprise) is often expressed with words such as: sudden turn, astonishment, contrast of representations, and so forth. However, all these terms can be covered with the unique concept of *surprise*.

This explanation of humour is based on the principles of S-R psychology, which results in one terminological problem. Namely, the above-mentioned basic, common sense judgements contain two subjective, *mentalist* terms which do not exist in the vocabulary of S-R psychology: *pleasure* and *surprise*. The principles of operationalism and the empirically verified *law of effect* enable simple transformation of the mentalistic term *pleasure* into the term *reinforcement*. Therefore in our analysis of humour with regard to the first axiom, we will start with reinforcement phenomenon.

When it comes to surprise, it is also possible to

translate it into S-R terms, but first we have to make an operational, logical-methodological move which we could also call *common sense – logical*. Namely, a common sense answer to the question *what is surprise* says that it happens when one thing occurs, and then immediately after, quickly and unforeseeably, something else occurs. Hence, surprise occurs when we react to one thing, one stimulus, after which another stimulus appears quickly to which we react as well. It follows that surprise is in fact a fast sequence of two reactions. If we label the two reactions with R_1 and R_2 , we can express this statement shortly: surprise is a fast sequence of R_1 and R_2 (in the following: R_1-R_2).

Being that we always react to a certain stimulus, a complete formula of surprise would be: $S_1-R_1-S_2-R_2$, where S_1 and S_2 are stimuli that provoke R_1 and R_2 . However, for the purpose of being economic, surprise will be symbolized only with R_1-R_2 , which will axiomatically imply the presence of stimuli (S_1 and S_2). This decision is in accord with the main focus of this paper, and it is on reactions (reinforcing reaction, reaction of surprise, reaction of laughter, etc.).

If we now express the two judgments from the beginning, they would look like this:

- (1) Humor is reinforcement and
- (2) Humor is a fast sequence of R_1-R_2 .

The following development of the problem and its solution will lead us to discovering the type of reinforcement (pleasure), i.e. the type of R_1-R_2 sequence (surprise) humour belongs to. Surely, every type of pleasure is not humour, nor is every type of surprise funny, but stands the opposite.

To solve the problem first we have to look at the types of reinforcement and R_1-R_2 sequence that exist. Only after decomposing these two variables, we can try to determine which of the previously established categories humour falls into.

Reinforcement

Theory of learning, founded on numerous researches [11; 4] postulated two basic types of reinforcement based on learning two basic kinds of

instrumental reactions:

1. *Appetitive (positive) reinforcement* – based on performing the reaction that leads to a reward (learning through rewarding).

2. *Aversive (negative) reinforcement* – based on not performing the reaction that leads to a punishment (learning through punishing).

In both cases the right reaction leads to reinforcement. In appetitive reinforcement, execution of the reaction (R) leads to reward (+), so we can label it shortly with R^+ . For example: an animal presses a lever (R) and gets food (+); a man goes into a restaurant (R) and drinks beer (+).

In aversive reinforcement, not executing the reaction (nonR) leads to avoiding a punishment (–), i.e. to some kind of reward (+). For example, at the sound (S^-) that signalizes approaching shock (–), the animal stops pressing the lever (nonR) and goes into the other close chamber of the cage. This kind of reinforcement should therefore be labeled with the unique symbol $nonR^+$, as not performing the reaction (nonR) leads to a reward (+). Considering that the symbol nonR seems imprecise and unspecified, it can be replaced with R_2 , because *nonR* is in fact *some other R*, that is, some other reaction (not reacting does not exist). Hence, this type of reinforcement can be labeled with R_2^+ since performing some other reaction (R_2) leads to reward (+). Since this way of symbolizing imposes the question of origin of “2” in R_2 , it is necessary to define what is “one”, i.e. what R_2 is preceded by. Therefore a complete symbolization of this type of reinforcement looks like this: $S_1^- - R_2^+$. This means that since performing the reaction R_1 to an unpleasant situation, i.e. stimulus, S_1^- , leads to a punishment (–), only non R_1 , that is R_2 , leads to reinforcement (+). The negative reaction (R_1^-) to the negative stimulus (S_1^-) is avoided by performing the positive reaction (R_2^+).

This would be the *avoidance reaction*, i.e. aversive reinforcement by avoidance reaction. The avoidance reaction is characterized by performing the reaction R_2^+ before experiencing the punishment, just to the exposure of the negative stimulus (S_1^-). Therefore, the reaction of punishment (R_1^-) is avoided as the name implies.

However, there is another type of aversive reinforcement that is based on the *escape reaction*. It is similar to the avoidance reaction with a difference in *saving reaction* (R_2^+) being performed after experiencing the punishment (R_1^-). For example, an animal receives a shock in one chamber of the cage (R_1^-) and then escapes into the other chamber (R_2^+). A man, after experiencing nausea (R_1^-) from several beers he drank, leaves the restaurant (R_2^+). Hence, in

this type of aversive reinforcement the punishment cannot be avoided, but escaped from. Therefore a symbolic representation of this type of reinforcement would be: $R_1^- - R_2^+$. From a negative reaction one escapes by performing a positive, reinforcing one.

Finally, we have established three kinds of reinforcement:

1. Appetitive reinforcement (R^+ , or more precisely R_1^+)
2. Aversive reinforcement
 - a. Aversive reinforcement by avoidance ($S_1^- - R_2^+$)
 - b. Aversive reinforcement by escape ($R_1^- - R_2^+$)

In order to make this trichotomy clearer, we will use some examples:

1. Appetitive reinforcement: eating favorite food, drinking favorite drink, smoking, sex, playing tennis, swimming in the sea, playing a guitar, studying a favorite subject, etc. (performing *pleasant* reactions).

2a. Aversive reinforcement by avoidance: not drinking alcohol (avoiding unpleasant consequences of alcohol consuming), not smoking, dressing warmly in the wintertime (avoiding the cold), dressing lightly in the summertime, studying (avoiding rebuke, bad grades), skipping a class to avoid getting a bad grade, etc. (*avoiding unpleasant* situations, i.e. reactions).

2b. Aversive reinforcement by escape: eating food that we do not like just to satisfy the hunger (“escaping” the unpleasant hunger), drinking alcohol out of sorrow, swimming in the sea in the summertime (“escaping” the heat), divorcing when in a bad marriage, marrying (“escaping” loneliness), skipping a class after getting a failing grade etc. (*escaping* or *aborting*, *terminating unpleasant* situations).

We can notice that it is possible for the same reaction to belong to (1) and (2a) and (2b) at the same time, as well as for two opposite reactions to belong to the same group of reinforcement. It all depends on whether we like a reaction or we just use it to avoid the other, more unpleasant one, or both. For example, swimming in the sea is both: appetitive (pleasant reaction), and aversive reinforcement (avoiding the heat). Likewise, marrying can be appetitive reinforcement, when we love our partner, and/or aversive, when we are avoiding loneliness, or, for example, poverty (a marriage for interest).

In fact, at the human level, reactions that serve as only one type of reinforcement are rare. The most common are the combinations of different types of

reinforcement. However, in every reaction we perform, one type of reinforcement is dominant.

With this we finish the analysis of the first axiom relevant to humor - reinforcement. This analysis was necessary since our assignment is to explain humor phenomenon by determining the type of reinforcement it belongs to. That is an enigma that has been puzzling human kind for centuries: what is that pleasure provoked by a joke? So far, that question has not been answered neither by philosophy or medicine, nor psychology.

2) R₁-R₂ sequence

When reviewing reinforcement, we said that reactions can be:

1. Reinforcing, *favorite* (R⁺) and
2. Non-reinforcing, punishing, *not favorite* (R⁻).

According to this, an R₁ – R₂ sequence can appear in 4 combinations:

1. R₁⁺ - R₂⁺,
2. R₁⁻ - R₂⁺,
3. R₁⁻ - R₂⁻ and
4. R₁⁺ - R₂⁻.

The sequence 1 is present when one performed reinforcing reaction (R₁⁺) is followed by another also reinforcing reaction (R₂⁺). This sequence is known as happiness, joy, game, etc. Sequence 2 is a pleasant surprise or wonderment, sequence 3 is torture, maltreatment, being frustrated, bored, while sequence 4 corresponds to what we call disappointment, drama, tragedy and catastrophe.

Humour – an aversive reinforcement by escape

After having *dissected* our second axiom – the R₁-R₂ sequence, to explain humour we now have three types of reinforcement and four types of R₁ – R₂ sequence (table).

Table

Types of reinforcement and R₁ – R₂ sequence

Types of reinforcement		Types of R ₁ – R ₂ sequence	
1.	Appetitive reinforcement (R ⁺)	1.	Joy, happiness (R ₁ ⁺ – R ₂ ⁺)
2a.	Aversive reinforcement by avoidance (S ₁ ⁻ – R ₂ ⁺)	2.	Wonderment (R ₁ ⁻ – R ₂ ⁺)
2b.	Aversive reinforcement by escape (R ₁ ⁻ – R ₂ ⁺)	3.	Torture (R ₁ ⁻ – R ₂ ⁻)
		4.	Tragedy (R ₁ ⁺ – R ₂ ⁻)

All we know about humour is that it is both reinforcement and an R₁ – R₂ sequence. Hence, humour is that type of R₁ – R₂ sequence which exists in reinforcement as well. If we now look at the repertoire of potential concepts for explanation of humour, we can see that the only type of R₁ – R₂ sequence that goes along with some type of reinforcement is the sequence type 2 (R₁⁻ – R₂⁺). It certainly belongs to type 2b reinforcement, that is, to the escape reaction (R₁⁻ – R₂⁺). Humour is, therefore, reinforcement by the escape reaction. From this follows our first or *working* definition of humour: humor is a fast sequence of two reactions in which reinforcement is achieved by the escape reaction.

In the previous text we have come to the conclusion that humor is a pleasant surprise, moreover, it is wonderment, which falls under the specific type of reinforcement known as the escape reaction. Naturally, humour is not about the escape reaction in literal sense, at the motor level, but at the symbolic, cognitive or mental level. Namely, according to a number of researches [10; 5], the laws which are valid for motor reactions, are also valid for the cognitive ones. The difference is that in humor, due to a greater speed of thought reactions, the escape reaction will be faster, and therefore, reinforcement will be more sudden (which we experience in phenomenon of laughter). We find similar reinforcement by *escape* in psychoanalytical talk about psychological escape from reality, or “escape” into illness, running away from problems, turning to past, etc.

Like any other hypothesis, this one will also remain weak if not reinforced by the facts. Hence, let us take a look at what empirical evidence says. We give several examples of humor:

1) We look out the window and see our not so favorite boss walking down the slippery street. The boss suddenly slips and falls down. (Many people will laugh at this). Therefore we have: walk of a not favorite man (R₁⁻) and his fall (R₂⁺).

It should be noted that we will not laugh if this story is about a person dear to us (R₁⁺).

2) While driving, we get overtaken by a speeding car (R₁⁻). After a few kilometers we see the same car pulled over by the police for speeding (R₂⁺). We smile.

3) I never had any luck. For example, I have never found a four-leaf clover (R₁⁻). My only good fortune is that my paycheck has four zeros (R₂⁺).

As we can see, the examples confirm our hypothesis. In all of them we have the R₁⁻ – R₂⁺ sequence, that is, the reaction of escape from negative to positive. Let it be noted that this reaction

is fast and therefore the reinforcement is sudden. We can say that the hypothesis is now strengthened, verified. However, methodologists of science say that positive examples do not confirm the hypothesis or they do it very weakly. Each of the next positive examples, that is in accord with the hypothesis, has less and less power of corroboration. One hypothesis is good if it successfully resists attempts to prove it invalid, if it is impossible to find an example that contradicts the predictions that follow from the hypothesis (falsification principle). The existence of only one such an example proves the hypothesis wrong. Indeed, one negative example is “worth” more than a hundred positive ones. For the purpose of illustration, we will shortly mention the two most famous hypothesis about humor so far – Freud's and Bergson's – and demonstrate how easy is to prove them wrong by using the falsification method.

Sigmund Freud [2] claimed that the source of satisfaction in humor is in expression of sexual and aggressive impulses. He found confirmation for this in many jokes about sex or aggression. However, as it just have been said, these examples do not help him as much as numerous non-sexual and non-aggressive jokes contradict him. Hence, his hypothesis fails.

Henry Bergson [1], wrote that repetition of an action is what makes us laugh and also that the cause of our satisfaction in a joke is *turning a man into something mechanical* (doll, machine). That is, we laugh when we see a man *regress* to a lower level of his development. For both the first (repetition of an action) and the second (turning a man into something mechanical) Bergson's thesis, we can easily find many contradicting examples.

Are there examples that contradict our hypothesis of humour as the escape reaction? Unfortunately, it seems like there are. We can find examples of jokes with every possible combination of R_1-R_2 . Let us see:

1. The sequence $R_1^+ - R_2^+$:
 - a. The shorter the skirt (R_1^+), the longer the looks (R_2^+).
 - b. I am a marvelous housekeeper (R_1^+). Every time I leave a man, I keep his house (R_2^+).
2. The sequence $R_1^- - R_2^-$:
 - a. A man in love is not complete until he is married (R_1^-). Then he is finished (R_2^-).
 - b. In a hotel: “Hallo, reception! I cannot sleep in my room. It is full of flies (R_1^-)!” “You should sleep during lunchtime; all insects are in the dining room then (R_2^-)!”
3. The sequence $R_1^+ - R_2^-$:
 - a. That woman speaks eight languages (R_1^+) and can't say "no" in any of them (R_2^-).

As we can see from the previous examples, our hypothesis of humour as an escape reaction of $R_1^- - R_2^+$ type is not valid, and the remaining two types of reinforcement are even less plausible. How to escape this theoretical dead end?

Humor – dissipation of reactive inhibition

We remain on the trace of the escape reaction, but we will search deeper within it. Maybe there is an inter-variable between R_1 (of any sign) and R_2 (of any sign); some negative state, more negative than R_2^- , that every reaction, both reinforcing (R_1^+) and non-reinforcing (R_1^-), leaves behind. If that negative state can then be well “captured” and removed by some mechanism, that is, if we succeed in escaping from it into the reaction R_2 , humor can still remain the escape reaction.

Is there such a negative inter-state? Yes, there is. We find it in Hull's theory, in Hull's postulates [4; 6; 7; 8]. That state is *reactive inhibition*. Every performed reaction leaves behind the need for not repetition of the same reaction. Symbolically it can be expressed as Ir: inhibition produced by performing the reaction... Hull usually makes an analogy between these types of inhibition and fatigue, and he calls it inhibition similar to fatigue. Hull presumed that the reactive inhibition is a negative state, some type of negative impulse (negative drive). Therefore we have dissipation, spreading of reactive inhibition presented as reduction of impulse (drive – reduction), that is reinforcement.

It seems like the problem got solved with this. Humor is still the escape reaction, though not from R_1 , but from Ir_1^- (reactive inhibition of reaction R_1). The formula of humor is now $R_1 - Ir_1^- - R_2$, where the escape reaction is contained in the part: $Ir_1^- - R_2^+$. Hence, satisfaction in a joke comes from escaping unpleasant Ir, or, put in Hull's terms, it comes from dissipation of Ir.

How does dissipation of Ir happen? It is simple: Ir_1 is a striving for R_1 not to be repeated. This means that the striving is adequate to a drive for execution of some other reaction (non- R_1), which is none other than some R_2 . The condition of humour being an $R_1 - R_2$ sequence is therefore satisfied. Ir_1 gets dissipated by the fast sequence of R_2 after R_1 and reinforcement is achieved.

Here we have a simple phenomenon, although on the face of it, it might seem complicated. Namely, dissipation of Ir is the closest thing to what we call a rest from activity. For example, during studying (R_1) reactive inhibition on the activity of studying (Ir_1) is being gathered, which results in occurrence of the striving for another type of activity (e.g. walking (R_2)), that will dissipate Ir. It should be noted, however, that in humor we have a *sudden* rest, because of the great speed of the sequence.

If we consider Ir as fatigue, the hypothesis could

also be independent from Hull's theory: humor would be a sudden rest. This would be in accord with the ubiquitous emphasis on the benefits of laughter: a joke brings us work and then immediately after a rest from work, which resembles an active rest, recreation, exercise.

Reactive inhibition is present whenever we find further execution of some action to be hard, odious, boring, tiring, so the tendency to stop doing it or to do it in some other place occurs. This phenomenon is similar to "perceptual satiation", i.e. satiation and fatigue of the nervous paths which results in a tendency to move the nerve processes to a close or a distant zone [3]. For example, when carrying a heavy bag in one hand, after a period of time, we start feeling like putting the bag down or switching it to the other hand. Likewise, after a couple of chess games, we start feeling like changing the game and playing, for example, a game of cards. When watching ambiguous figures (Rubin's Vase, Necker's Cube, Schroder's Reversible Staircase), after a certain period of time (a few seconds), the background and the figure spontaneously switch in our perception, that is, one percept or meaning spontaneously switch with the other one [9].

How do we tie this to our examples of jokes? Take for example: That girl has not a good income, but she has a good outcome (giving, sex). First the activity R_1 takes place: the girl hasn't a good income (salary). Then fast we have a need for R_2 , that is, we have a need not to hear R_1 again (Ir_1). This joke gives this to us very effectively: "the girl is promiscuous" (R_2).

It must be stressed that R_2 is the more effective reaction of rest from R_1 the more it contrasts R_1 . In other words, the more R_2 is different from R_1 , the stronger and more effective dissipation of Ir_1 is going to be. It is logical that running (R_2) will be more effective rest from studying (R_1), than, for example, watching TV (R_3). Similarly, we will rest better from running (R_1) by lying down (R_2), than walking (R_3). This principle (regularity?) helps us understand the fact that in a good joke R_1 and R_2 are often opposite or disparate, unrelated to each other, which results in a sudden, explosive, one-stroke rest. Of course, the effect is stronger if R_2 is more of R_2^+ type of reaction, because in that case not only that we rest from R_1 , but we also accomplish the second reinforcement (R_2^+). For example, we will have a better rest from learning by playing our favorite sport basketball (i.e. running after ball), than by running in circles.

However, there is still some space left for potential critic. Namely, even if we agree that in humor we escape from negative Ir_1 , we can still ask how it is possible that R_2^- serves as a reaction of

"salvation" when it is non-reinforcing, unpopular (as we have seen in some of the examples of jokes).

To answer this question, we will start with the fact that not all the people laugh at " $R_1^+ - R_2^-$ " and " $R_1^- - R_2^-$ " types of joke. Let us remember the acquaintances who get disgusted by "black humor" and similar things. For them, R_2^- is too unpleasant as a result of acquired habits, i.e. previous aversive experience ($S_2^- - R_2^-$). We have to recognize, " $R_1^- - R_2^+$ " and " $R_1^+ - R_2^+$ " types of jokes are indeed more effective. However, that fact alone is not enough to exclude the two first mentioned types of joke from the class of humor, for there is the other part of population that finds them funny, and that is why they still remain humor.

Mediating reaction – association

We can ask ourselves how people who laugh at " $R_1^+ - R_2^-$ " and " $R_1^- - R_2^-$ " types of joke "derive" reinforcement from them. The answer lies in a mechanism that humour is based on, and which will be described in the following text. It exists after execution of every reaction. Of course, it is bigger after executing reactions that require more effort and bring less reinforcement (hence, after R^-). For example, we get more tired from digging (R^-), than from playing tennis or chess. Similarly, Ir is bigger after one hour of studying an unpopular subject (R^-), than after the same period of studying a favorite subject (R^+). We can derive the rule: Ir is directly proportional to effort and the number of executed reactions, and inversely proportional to the reinforcing effect of these reactions. Hence, the formula of Ir is:

$$Ir = \frac{SSS \text{ effort} \times \text{number of repetitions}}{\text{reinforcement}}$$

This means that Ir will also get amassed after learning the favorite subject, or playing the favorite game, but more slowly, i.e. after a larger number of repetitions. A strong reinforcing effect of a reaction, i.e. a big denominator of the formula, decreases the resulting amount of the formula, i.e. Ir , which requires a larger number of repetitions, i.e. bigger numerator. Hence, every executed reaction leaves behind certain amount of Ir , even the reinforcing one, only the amount of Ir after this one is smaller which raises the threshold of number of repetitions needed for experiencing the striving for reaction not to be repeated. However, after a large number of repetitions, inhibition will take place in spite of reinforcement.

After stopping the execution of reaction, Ir

begins to disperse spontaneously, which means that it is the biggest at the very end of the reaction. This brings us within an inch of the explanation of humour mechanism. Namely, humour “catches” the maximum of Ir, which is unpleasant enough so that sometimes even R_2^- can serve as the reaction of salvation, i.e. that all combinations of $R_1 - R_2$ can result in appearance of humour.

Now the question is by which mechanism this is accomplished. The answer lies in *associations*. The associations are the factor of connecting, of bringing stimuli, reactions *close together*. In a joke, the association puts R_2 right next to R_1 and in that way enables catching and dispersing of Ir at its maximum, at the very end of R_1 . This makes it possible for the unpleasantness of Ir_1^- to be bigger than the one of any other R_2 , even R_2^- . This way the difference in potential and flow of excitation are achieved (occurrence of reaction potential), even when it comes to R_2^- , because it is less negative than Ir_1^- at the given moment, and hence can be the reaction of escape from Ir_1^- . In other words, by the means of association the maximum amount of Ir_1^- is caught, even when it comes to R_1^+ , and if the caught negativity is bigger than negativity of reaction that follows (R_2), reinforcement is possible [11, p. 364] (Hull’s theory of reinforcement, postulate 16: competition of reaction potentials). This, as we have seen, does not work with everybody. In some people, the negativity of R_2^- is still too big, so there is no flow. Hence, the association makes possible reinforcement even in jokes of “ $R_1^+ - R_2^-$ ” type, but that does not mean it is superfluous in other combinations because there it increases the effect, i.e. already existing difference in potential. Of course, if we have the $R_1^- - R_2^+$ sequence plus association, laughter is guaranteed and enjoyment (reinforcement) is strong. This also applies for sequence $R_1^+ - R_2^+$, but the effect is somewhat weaker. The next place with regard to the strength of effect is taken by the $R_1^- - R_2^-$ sequence, while it is the most difficult to evoke laughter with the $R_1^+ - R_2^-$ combination. It should be mentioned that there are reactions neutral in their affective tone (neither “+”, nor “-”). The humorous effect in a sequence of these reactions is achieved quite easy, like in the other sequences of reactions with equal signs ($R_1^+ - R_2^+$ and $R_1^- - R_2^-$).

To summarize: however small Ir_1^- after execution of R_1 is, like it is in the case of R_1^+ , it is maximally exploited in a joke with the help of associations. However, the effect is stronger in the case of R_1^- , because of the bigger Ir_1^- . Next, R_2 , even non-reinforcing (R_2^-), can exceptionally serve as a reaction

of rest (salvation, escape), but the effect is stronger when it is reinforcing (R_2^+). Thus, humor is still the reaction of escape (from Ir_1^-) and the explanation remains consistent.

With a reminder that there are three kinds of associations (contiguity, similarity and contrast), and that humour equally uses all three of them without having preferences, in the following text we give some of the previously mentioned examples of jokes with indication of the concrete associations that are used in them:

1. I never had any luck. For example, I have never found a four-leaf clover. My only good fortune is that my paycheck has four zeros. (association by similarity: four leaf – four zeros)
2. “The shorter the skirt, the longer the looks.” (association by contrast: short – long)
3. “I do not live exactly well, I live in a damp, but at least I eat dry food.” (association by contrast: damp – dry)
4. “I am a marvelous housekeeper. Every time I leave a man, I keep his house.” (association by similarity: housekeeper – keep a house)

Classification of humor

According to the presented theory or hypothesis, it is possible to in principle differentiate between two kinds of humour:

- 1) Wit (catchword, raciness) and
- 2) Comedy (comics).

Catchword is a more complex kind because it consists of R_1 , R_2 and the association. Considering that association serves as a link, mediator between R_1 and R_2 , we call it mediating reaction (R_m). Hence, catchword has three reactions: R_1 , R_2 and R_m .

Comic is more primitive type of humor consisting of only two reactions: R_1 and R_2 , without any mediation. That means that R_2 directly (by distraction), without the use of link, “falls” on, i.e. behind R_1 . Examples of comic we find in slipping and falling of unpopular chief and in the person who took us over on a high-way paying a fine.

Since comic does not have the association, i.e. a mechanism that maximally exploits Ir_1 , its effect is more limited. Namely, it is possible only when there is stronger differentiation in favor of R_1^- , that is, in favor of R_2^+ , which makes it more *primitive*. Hence, comic *must not go far from* the pure type of the escape reaction ($R_1^- - R_2^+$). In more picturesque words, since comic does not have the “hose-pipe” (association) for “drawing” Ir_1 , it cannot rely on R_2 to be a reaction of salvation from R_1 or from Ir_1 , if R_1 itself is not more negative than R_2 (or R_2 is not more positive than R_1), which makes it a transition *from worse to better* per se,

i.e. a pure escape reaction, so the hose-pipe is not necessary.

Examples of catchword

At the end we give some examples of catchword with the sketch of explanation and let the reader determine by himself which type of R_1 - R_2 sequence they belong to (according to his "taste", i.e. his habits – S-R).

1. "It is the truth, the wine is in me".
 R_1 : In wine is the truth (Latin proverb).
 R_2 : I have drunk wine (I am drunk)
 R_m : association by similarity: in wine is the truth – it is the truth, the wine is...
2. "Love does not know for borders, but it does know for frontiersmen".
 R_1 : Love does not know for restraints. Everything is done for love.
 R_2 : Love sometimes happens to the frontiersmen.
 R_m : association by similarity: border – frontiersmen
3. "I am, therefore my parents didn't think".
 R_1 : I think, therefore I am (Descartes' proverb).
 R_2 : My parents did not think about what would become of me. If they did, they would not conceive me.
 R_m : association by similarity: I think, therefore I am – I am, therefore they didn't think
4. "He got everything easy, so he became a difficult man".
 R_1 : He has not worked too much.
 R_2 : He has earned a lot of money and now he has a bed temper.
 R_m : association by contrast: easy – difficult
5. "Work has made a man, but the night work".
 R_1 : Work has made a man – a proverb which says that man has become a reasonable being owing to work.
 R_2 : Man has been made owing to sex.
 R_m : association by contiguity: work – night work
6. "If you want your wife to be faithful as a dog, buy her a necklace."
 R_1 : There are methods to make a woman faithful.
 R_2 : Money and gold are those methods.
 R_m : association by contiguity: dog – necklace

Conclusions

As we have seen, an aphorism or a joke does not contain a universal (interpersonally accepted) type of sequence, defined by minus or plus of the reactions. It all depends on particular habits, that is, S-R connections that a given joke provokes. Namely, the same joke can be wonderment, torture or disappointment to different people, but it can also have various meanings for the

same person depending on the situation, that is, on the thing or the person which it relates to (S), and also on other S-R connections that can be dominating in a given moment (for example, mood).

Let us consider the aphorism 2, for example ("Love does not know for borders, but it does know for frontiersmen"). If somebody said that in the situation when "I am that frontiersman", reaction R_2 will probably be "+" reaction (R_2^+) and the effect of the joke will be more positive. However, if "I am that misfortunate lover whose girlfriend has left and gone away with some frontiersmen", reaction R_2 is "-" (R_2^-) and the effect of the joke is negative. Hence, we will have the $R_1^+ - R_2^-$ sequence (or even $R_1^- - R_2^-$), and no laughter, but anger, in spite of presence of certain amount of Ir_1^- (reactive inhibition on the frequently used saying: "Love does not know for borders"). Finally, if we are neutral (neither the frontiersman, nor the left boyfriend) in the mentioned aphorism, like in the case of reading it, the effect will be moderately positive.

We will end this exposition with a definition: humor is a quick sequence of two reactions that is achieved with the help of a mediating reaction (in catchword) or by direct distraction (in comics) during which the reinforcement is accomplished through the sudden dissipation of reactive inhibition of the first reaction in the sequence.

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