Cognitive aspects of the humor process: The concept of incongruity

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IS THE CONCEPT OF INCONGRUITY STILL A USEFUL CONSTRUCT FOR THE ADVANCEMENT OF HUMOR RESEARCH?

"There is alogic in humor."

Abstract
The perception of incongruity is considered to be a necessary, though not sufficient, component of the humor experience. Incongruity has been investigated in the philosophical tradition for centuries, and it goes back as far as Aristotle's definition of the comic as based on a particular form of *απάτη* (surprise and deception). In modern times, many theoretical models, as well as empirical works, are based on this concept. The question is here raised whether the concept of incongruity has already been examined and exploited to its full potential, and nothing new, of theoretical or experimental usefulness, may be drawn from it. It is proposed to conceptualize incongruity as follows: a stimulus is perceived as incongruous when it diverts from the cognitive model of reference. In this perspective, a number of observations are advanced which point to a heuristic property of incongruity still open to interesting developments, both for theory and for applications.

Keywords
Humor, incongruity, incongruity resolution, cognitive model.

1. A preliminary doubt

"Incongruity" is a term we find mentioned countless times in humor research literature. It is widely considered to be one of the most important concepts, if not the most important, as to the description and explanation of the humor process. It has been thoroughly examined by so many scholars and researchers, and under so

many aspects, that a legitimate doubt may arise whether its heuristic value has not been already fully exploited, and whether its potential for theoretical and experimental advances should not be considered exhausted.

2. A synthetic overview: from philosophy to contemporary psychology

Many of the reviews which examine incongruity and humor start with the observation that we have to go as far back to the same origin of western philosophy to find the first relevant statements (see for instance Spiegel 1972; Santarcangeli 1989; Attardo 1994). An authoritative and prestigious imprinting was provided by Aristotle. He did not use a term directly corresponding to "incongruity," and he did not employ a word directly referring to humor, which is a relatively modern word. In the sense we use it nowadays it originates only in the sixteenth century (see Escarpit 1960). He was anyway concerned with humor-related phenomena, such as comedy and the comic, and laughter. He highlighted the role of *απάτη* (a mixture of surprise and deception) in connection with these phenomena. With a partly forced interpretation, this can be considered the seed of the concept of incongruity.

The most inclusive list of philosophers, scholars, and literary persons who have used incongruity, or closely related concepts, in the description and explanation of humor is likely to be that compiled by Grimes (1955). Being mainly interested in analyzing the communicational dimension of humor in public address, Grimes enumerated 46 authors divided into two main categories according to their writings: rhetorical and non-rhetorical. The list starts with Plato, Aristotle, Cicero, and goes on with such personalities like Bacon, Hobbes, Descartes, Bain, Pascal, Hegel, Schopenhauer, Beatty, Kant, Spencer, and Bergson.

Furthermore, for some authors she considered also additional elements of specificity beyond incongruity, like deformity, turpitude or defect (not painful), as in Aristotle; some kind of contrast, as in Schopenhauer and Bergson; the unexpected, or a disappointed expectation, as in Beattie, Kant, and Spencer; the deviation from normal, as in Pascal, and Hegel.

In modern times, contemporary psychology has taken the main disciplinary commitment to the analysis of incongruity in humor (for a review see Martin 2007), and many models describing and explaining the functioning of humor are based on this concept. One of the most influential was introduced by Suls (1972), who featured an information processing analysis proposing a two-stage humor appreciation model (see also Shultz 1972; for a proposal in the field of linguistics which presents some anticipatory features, see Morin's three-function schema, 1966; see also Raskin 1985). This, which is more precisely regarded as a humor *comprehension* model (as McGhee and Goldstein, 1972, commented), is articulated

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into 14 steps and 4 possible detours from perceiving the humorous stimulus (a joke) to its comprehension. The inclusion of detours, which prevent an individual from understanding the joke and hence from its appreciation, is an element of importance and novelty in humor theory. Whereas traditional theories tried to describe and explain (only) why and how people understand and enjoy humor, Suls' model also provides reasons as to why and how it happens that listening to a joke may not end in a humorous reaction.

The two stages became extremely familiar in the domain of humor research, the first being the perception of an incongruity, the second its resolution. The resolution is based on what Suls calls a "cognitive rule" which reconciles the incongruous parts. The cognitive rule, which can be semantic, logical, or experiential, is identified through a problem solving activity. It is to be noted that not getting the cognitive rule is one of the main detours in the model which prevent the appreciation of the joke. An example of how the two stages work can be offered by the famous, first *witz* in Freud's book (1905). Hirsch-Hyacinth expressed his delight that Baron Rothschild had treated him in a "*familionär*" way. The word is not congruous with normal language (1. an incongruity is perceived), but there is a cognitive rule which gives it sense: merging *familiär* and *milionär* a compound adjective is created, conveying a meaning: he treated me familiarly insofar as it is possible for a millionaire to do so (2. the incongruity is solved). From the early 1970s a stream of research and a lively debate started (for a detailed account and analysis see Forabosco 1992; for an update, see Martin 2007).

One question in particular came to attention. Is incongruity resolution a necessary stage? Is it possible to have humor instances based only on the perception of incongruity? McGhee (1971), for instance, stated that children have humor reactions based on incongruity alone, and before the age of eight they are not cognitively ready to adequately engage in the resolution task (Pien and Rothbart, 1976, backdated this to the age of four). Bariaud (1983) noted that children can find amusing also jokes and cartoons they do not actually understand (that is they do not get the *point*, the cognitive rule), because they appear to appreciate the incongruity itself, or even some aspect which is not meant to be the central incongruity but still may be perceived as incongruous (say, a character with a very big nose). But it was a study conducted by Nerhardt (1970) which proved the role of the incongruity as such to be the key factor for a humor experience. He designed an experimental condition in which subjects were confronted with incongruity in its pure form, in non-verbal, culture-free conditions, quite unusual in humor studies. Ss were asked to lift a series of weights to evaluate them. The final one was either much heavier or much lighter than the others. Many Ss reacted with smiles or laughter and the frequency of these reactions corresponded to the degree of discrepancy from the expected weight. His study started a flow of empirical

research under the label of Weight Judging Paradigm (WJP) which has investigated many important aspects and implications (see Deckers 1993).

"One model or two? Probably we need two," was Suls' conclusion (1983: 47): one model based on the incongruity perception *and* resolution, and another based on incongruity alone. Verbal humor is mainly based on the two-stage process, whereas much of visual, and children, humor is made up of pure incongruities.

An alternative vision is possible however in which the two models represent the two main cases of a unified construct. To accomplish this vision, we need to frame it into a very broad theoretical context. In fact, talking about incongruity means to a great extent to talk about how the mind functions. The human being lived, and lives, in a very complex world, and comes across myriads of stimuli. In order to survive people have learned to simplify all this complexity, mentally organizing and categorizing. That means to form those cognitive entities we call schemes, sets, categories, classes, and concepts. In the present context it seemed useful and appropriate to assume, for a general designation, still another term, namely "models." Here the term is employed in a very similar way in which it is used in epistemological contexts. In particular, this term

> "highlights the comparative and interpretative aspect: a model is a sort of preliminary representation and minitheory which the subject uses in his relationship with reality" (Forabosco 1992: 54).

In this sense, models are conceptual abstractions of the outer and of the inner world, with the main function of structuring, simplifying, and making them cognitively manageable. We expect models to correspond to whatever comes within the horizon of our experience, and vice versa, we expect the incoming stimuli to match the cognitive model. A little child has normally built up a model of a human face as having two eyes. And when the child perceives a human face, he expects to see two eyes. But what if the stimulus does not match the model? What if he is confronted with a three-eyed face? (an example proposed and analyzed by Kagan 1967). He experiences what we call the *perception of an incongruity*. The typical associated reactions are puzzlement, curiosity, discomfort, and/or fear; all tendentially accompanied by the need to eliminate (= solve) the incongruity. The resolution of an incongruity in general follows the two principal adaptational strategies, namely accommodation and assimilation. Either the child accommodates his model in order to include the incongruous stimulus (faces can have three eyes), or he assimilates the stimulus into the existing model, eventually expanding it ("the three eyes are only depicted," "it's a mask"; see the concept of "fantasy assimilation" advanced by McGhee 1972).

The crucial statement then becomes: a stimulus is incongruous when it diverts from the cognitive model of reference. A minor difference is here introduced in this definition in comparison with the previous formulation (Forabosco 1992):

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diverts instead of *differs*. The reason is linked with the fact that, suggestively enough, "to divert," coming from the Latin "diverto," has the same root as such a word as the Italian "divertimento," which corresponds to "fun." What is interesting to note is that it includes, at the same time, an association with incongruity (as a *deviation from*) and with amusement (this is typical for neolatin languages; see for instance the French "divertissement," or the Spanish "divertimiento").

Cognitive models are, to some extent, different for different subjects, and they change with experience. Among other things, this identifies an important factor which helps to understand the variability of humor reactions (and of sense of humor) among different subjects and within the same subject at different times.

In normal conditions, the perception of an incongruity starts a process which aims to fully resolve the incongruity (a related concept is that of cognitive dissonance in which also the tendency is to eliminate, or reduce the dissonance; see Festinger 1957). Humor is a phenomenon to which the normal rules of incongruity perception do not apply in the usual way. It has a statute of its own (being akin to other areas of human experience, such as play, art, poetry, and dreaming). As previously mentioned, the mind needs models to classify, organize and simplify (our knowledge of) reality, and we need them as stable as possible. We resist changes. Incongruities call for full resolutions. Humor, on the contrary, is a play between stability and change, a close and an open mind. It is a way of dealing with odd, abnormal situations (elephants in the fridge, thousands of people who change a light bulb), accepting the oddities and abnormalities, provided that they do have some sense, but without trying to make complete sense of them. By the way, this can help not to be afraid of changes, and to feel safe about the way our minds control the world, as complex and strange as it may be.

Summing up, for a humor experience to take place we need to have an element of incongruity and an element of sense, a *criterion* which renders the stimulus cognitively acceptable. In the two-stage model the element of sense is acquired in the resolution stage through the identification of the cognitive rule. In the model encompassing incongruity perception alone, the element of sense is contextually, and contemporarily, available: this may be described as a figure-ground configuration (a uni-configurational pattern), in which the incongruous element is at the fore and the element of sense is in the background, not explicitly perceived but perceptible if an attention shift were to be performed (the child may feel, or say: "It is (only) a mask!" Interestingly, the mask used in the comedy was the example Aristotle gave as presenting the conditions to excite laughter, something "ugly and distorted without causing pain"). In the WJP, the element of sense is linked to remarks of the kind: "It's a trick"; "It's a practical joke"; "I've been fooled"; or, in a more elaborate way, to the observation that though it is odd (even silly) to be asked to evaluate the differences between weights when these are very ample, and hence obvious, there is not a rule which forbids this eventuality. A

unifying model can then be stated in which both the incongruity and the congruity elements, either in succession or simultaneously, need to be processed in order to exert a mental control of the stimulus, a *cognitive mastery*, and to allow a humor experience. In humor, pure incongruity is not absolute incongruity.

To complicate, or enrich, the picture, another component is to be taken into account, that of a further stage (Ruch and Hehl 1998). An expansion of the theoretical model is suggested by the fact that if the processing would simply end with the resolution of the incongruity, the stimulus would make sense and the processing simply stop: there would be comprehension, adaptation, and cognitive balance. Normally, if the incongruity is completely resolved, no humor appreciation ensues (see Forabosco 1992). In order to have a humorous effect, the cognitive tension must be kept, to some extent. Hence, the final step is that of getting the flavor of humor which is connected with the perception of a residual incongruity (or nonsense). This may be considered as a third (or second) stage, but it is better framed as a *second level processing*, that of a meta-level in which the subject elaborates an implicit/explicit message about the humor value of the stimulus. Considering that a preliminary meta-communication is also to be assumed in order to orient the processing of the stimulus in a humorous way (non-literal, not serious) we can state that the basic cognitive humor process includes the following steps:

1. a prerequisite: "this is a joke" (meta-communication)
2. an incongruity is perceived
3. the incongruity is solved
4. a final conclusion: "it is funny" (meta-communication)

It is interesting to note that the first and fourth steps also correspond to explicit messages when a joke is told in social interactions: "I will tell you a joke," "How funny!" (for the role of meta-communication in humor see the classic observations of Bateson 1952, and Fry 1963).

One important implication of this process, which requires one or two stages and two levels of elaboration, is linked to its evident complexity. Understanding and appreciating a joke is not a simple cognitive matter, however spontaneous and unaware people may be in performing this task thousands of times. A cognitive mastery, an ability of a quite high level, is required. This is particularly confirmed by two observations.

1. Children do not acquire a full capability in dealing with jokes before they have developed the adequate mental skills; and this is progressive learning which takes years to go from simple jokes to more complex ones. As McGhee (1979) noted, this is tightly linked to the evolution of cognitive stages in general.

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2. People suffering from mental disorders, especially schizophrenia disorders, which impair thought abilities, have been reported also to have difficulties in the comprehension of jokes (for a review, see Forabosco 1998).

3. The contribution to and from Linguistics

An experimental study, in two parts, was conducted to investigate the *seriality* effects in joke telling and appreciation (Forabosco 1994). The aspects analyzed regarded the aspecific (joke independent) and the specific (joke dependent) effects on appreciation when jokes are presented to a subject in sequence. Among the firsts, a "fractional warming up" effect emerged. Independently from the characteristics of the jokes (which were randomly changed in their sequential position during the presentation to the Ss) an increasing appreciation was observed from the first to the following jokes. Unlike the findings of Byrne (1958), who had obtained a warming up effect for a whole sequence of 22 jokes, the effect was detected for a fraction of the sequence.

Even more interesting were the findings of the second part of the study (Forabosco 1994). Applying the General Theory of Verbal Humor, GTVH (Attardo and Raskin 1991),[1] jokes were classified for their similarity, defined on the basis of the elements they had in common. The GTVH lists six elements, or parameters, denominated Knowledge Resources (KRs): Language (LA), Narrative Strategy (NS), Target (TA), Situation (SI), Logical Mechanism (LM), and Script Opposition (SO). Simply stated, if two jokes share all the KRs they can be considered similar to the point of being identical (even though some words may vary). If they do not share any of the KRs, they are perceived as completely different. All the possible intermediate degrees may potentially be given, considering that there is a hierarchical order among the KRs (the LA being at the lowest degree and SO, together with LM, being at the highest). The general rule is that the higher in the hierarchy the KRs the jokes share, the more similar the latter are. In the second part of the study a specific factor appeared to be at work, that of the increasing incongruity. The sequence rated higher for appreciation was that corresponding to a growing incongruity. The three jokes are (consider that "carabinieri" are the Italian state police and represent the typical target for the dumb version of light bulb jokes; see Davies 1990):

1. How many carabinieri does it take to screw in a light bulb? Five. One who takes his shoes off and gets on a table to hold the light bulb and four to turn the table.

[1] A lively debate, particularly within the linguistic field, is going on whether the GTVH should, or should not, be considered (also) an Incongruity Theory (see Dynel, forthcoming).

2. How many carabinieri does it take to screw in a light bulb? One hundred. One who takes his shoes off and gets on a table to hold the light bulb and 99 to turn the ceiling.

3. How many carabinieri does it take to screw in a light bulb? Five. One who takes his shoes off and gets on a table to hold the light bulb and four to spray deodorant all around.

From joke 1 to joke 2, it can be observed that the degree of incongruity is ascending. And from pair 1, 2 going to joke 3, there is a shift as regards the model of reference evoked. What is interesting to note is that this appears to parallel what can be interpreted in terms of change of the KRs implied. From joke 1 to 2, there is a quantitative rise in the LM, in the form of an exaggeration; and, as Attardo and Raskin (1991) noted, whereas in jokes 1, 2 the script opposition is smart/dumb, in joke 3 is clean/dirty (it should be specified that in joke 2 there is also an SO possible/impossible: turning a ceiling is not a realistic enterprise; it is anyway still linked to a mechanism of exaggeration). In this case, similarity, defined according to the GTVH, and incongruity are linked in an inverse relationship. The element of "seriality" can be applied and expanded to texts other than simple, short jokes. Attardo (2001) advanced, in the linguistic perspective, a detailed and sound analysis of humorous texts, examining case studies like "Lord Arthur Savile's Crime" by Oscar Wilde. He introduced categories such as the "jab line" (a non-final punch line), "strands" (three or more lines which are related), and "stacks" (strands of strands), and delineated a methodological tool which helps to go beyond jokes in the study of humor.

Referring to the experiments on "seriality," Martin (2007) observes:

> "These investigations provide examples of how psychological research methods might be used to test linguistic theories of humor, as well as linguistic theories might be used to inform psychological research" (: 92).

Martin himself showed this interdisciplinary attitude. In an experiment based on the domains-interaction approach, originally used to study metaphor, Hillson and Martin (1994) employed jokes of the structure "A is the B of A's domain" ("John Candy is the hamburger of actors," "Woody Allen is the quiche of actors"). In this way they got a precise operationalization of incongruity and resolution, incongruity corresponding to between-domain distance (greater distance, greater incongruity), and resolution to within domain distance (less distance, greater resolution). The *distance* was established by means of semantic differential ratings. The main finding was that humor ratings were positively correlated with incongruity but not with resolution. Martin's self-criticism was that this technique has several limitations, and "it allows only for the study of simple "pseudo-jokes"

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made up of word pairs" (2007: 95). Nevertheless, it points to a stimulating area open to joint disciplinary contributions.

Another interesting example of this kind of contribution is the following. In the attempt of modeling incongruities and their resolutions using set and graph theory, Attardo et al. (2002) enriched the GTVH, expanding in particular the KR named "logical mechanism." In a previous work Attardo (1997) advanced the observation that the SO corresponds to the first phase of joke processing, the perception of an incongruity, whereas the LM corresponds to the resolution phase. In the first presentation of GTVH (Attardo and Raskin 1991), some typical and basic LMs were illustrated, such as the figure-ground reversal, garden-path phenomena, juxtaposition, faulty reasoning, or chiasmus. Analyzing Gary Larson's "Far Side" cartoons, Paolillo (1998) listed up to thirteen different forms of LMs. This list was questioned by Attardo et al. (2002) on various bases; for instance, that the levels of specificity of his proposed LMs were not the same. It became clear anyway that listing the LMs was a challenging and stimulating task. That led to a table in which all known LMs were catalogued, totaling 27. Some of them are familiar, and previously included in other lists, like figure-ground reversal, exaggeration, analogy, etc. Others are relatively new or unexplored, like vacuous reversal, reasoning from false premises, etc. Some introduce concepts which are of particular importance, but they are understandable only with the adequate theoretical frame, such as cratylism and metahumor (see Attardo 1994).

Two observations are of specific relevance here. The first is that when talking about incongruity it should be borne in mind that it is in fact *potential incongruity*: a given stimulus *may* be perceived as incongruous because of its characteristics, but the actual incongruity perception is a completely subjective experience. The second observation regards the suggestions for further research. Not only the listing and characterizing of LMs can be a promising continuation of this line of inquiry, but also offer an additional opportunity. This can be accomplished reversing the perspective: from the analysis of existing jokes and the identification of the LMs, to the analysis of LMs and their application to generate humorous texts. What is to be underlined is that a systematic study of incongruity perception and incongruity generation can also be a fruitful way to favor the process of humor creation.

4. Mind and brain

A promising line of research was introduced studying the brain functioning in relation to humor. One of the first relevant statements was advanced by McGhee (1983) who suggested, on the basis of neurological evidence, that the two brain hemispheres be both involved in the two stages of incongruity perception and

resolution but in different ways, the left hemisphere "setting up" the joke and the right "getting it." This pattern was not confirmed in its schematism by subsequent research. For instance, Derks et al. (1997) recorded cortical electrical activity of subjects while hearing jokes and they found that the activity was present in both hemispheres. Further research has described more articulated patterns of the cortex functioning in networks (see Wild et al. 2003; Bartolo et al. 2006; Coulson and Severens 2007).

Since then, there has been a stream of investigation which has yielded interesting findings. A suggestive one was obtained by Derks et al. (1997). By means of the analysis of ERP (event-related potentials) they could describe a typical cortical combination of a positive wave with 300-ms latency (P300) and a negative wave 400 ms (N400) after the stimulus had been perceived. This was interpreted as reflecting the two stages of incongruity detection and resolution: the P300 indicating an activity of categorization, and the N400 representing the perception of an element which disrupts the categorization process, as it happens when an incongruity is detected. There is a tentative, and striking, frame in which cognitive and brain mechanisms appear to coincide (see also Forabosco 1998). However, this interpretation has been partly disputed, particularly on the basis that it is not clear whether the N400 is to be associated with the first or the second stage of perception and resolution of the incongruity; furthermore, the N400 is considered to reflect semantic processing in general and it is also evoked by non-humorous stimuli (Kutas and Federmeier 2000; Uekermann et al. 2007). The observation about this resulting lack of specificity was complemented by a finding obtained by Coulson and Kutas (2001; see also Coulson and Wu 2005) who reported different positive and negative ERP effects, within the same time window, hence showing also a lack of uniqueness of the P300/N400 pattern. This deficiency of specificity and of uniqueness is to be seen, to a certain extent, as a limitation to the model "two stages/two waves," and it represents a conceptual and methodological problem still to clarify (which represents, after all, another challenge for further inquiries).

On the other hand, it should be noted that the analogy and correspondence between seemingly different cognitive processes, in relation to brain mechanisms, can have significant findings and suggestions to offer. As William Fry put it, there is a "significantly wider array of scientific data that can be contributed to greater understanding about CNS [Central Nervous System] function in humor. What is required as the key to this treasure house is simply the aptitude and willingness to perform a translation [...], from one word or phrase, into the language indigenous to the humor studies culture" (2002: 315). As a notable example among others, he refers to the research by Carter et al. (1998). They conducted an fMRI examination of CNS activity during *error* exposure, testing the hypothesis that the anterior cingulate cortex (ACC) is the brain area designated to monitor competition

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between *processes that conflict* during task performance. A response competition takes place when a given task elicits an inappropriate response tendency that must be overcome to perform correctly. The prediction was that response competition will activate the ACC. Neither humor nor incongruity were introduced in the picture. But, as Fry notes,

> "When 'error' and 'processes that conflict' are translated to indicate the presence of *incongruity*, and 'inappropriate response tendency' is translated into 'getting the joke', the relevance of this study to humor is obvious" (: 317).

All the above shows that this research journey is at its very beginning, and it needs to progress. At the same time, the fascinating area of brain-mind interplay can find in the particularities of humor process a highly stimulating challenge, and incongruity appears to be a crucial concept in this interplay. An increasing attention, and the availability of an ever-growing technology (from Event Related Potential, ERP, to Magnetic Resonance Imaging, MRI, functional Magnetic Resonance Imaging, fMRI, Positron Emission Tomography, PET, Transcranial Magnetic Stimulation, TMS), can offer a very interesting perspective for future achievements (for a description of the aforementioned technologies, and a review of applications and results in humor research, see Fry 2002; see also Wild et al. 2003; Bartolo et al. 2006; Goel and Dolan 2007; Uekerman et al. 2007).

5. A criticism towards the incongruity construct

Probably the most interesting critical position towards the concept of incongruity was held by Eichinger Ferro-Luzzi (1990; see also Veale 2004; Cundall 2007). Latta (1999) raised also a case against incongruity, but his arguments have been radically criticized in a close and tough analysis by Oring (1999). Eichinger Ferro-Luzzi acknowledges the importance of incongruity in humor, but she censures the theorists, whom she describes as "essentialists," who consider incongruity a necessary, though not sufficient, element of humor. She claims that there are instances of humor (examples are taken from Tamil humor) in which incongruity is not relevant, or congruity instead of incongruity is the basic element. And, in general, she maintains the inadequacy of essentialist theories, offering a polythetic-prototype approach as a more valid alternative.

The weakest point of her position is that, by her own admission, she relies on a dictionary-based (the Webster) definition of the term. Though this may be correct for everyday needs, a theory-dependent use of the word offers a more adequate perspective, from which the presence of an incongruity perception can be stated as a structural feature of humor. Nevertheless, there are at least two important points

which can be of interest. The first one is that the forms of humor are of an extremely high variety, and incongruity, though a defining feature, is not present, and detectable, to the same extent. For instance, nonsense humor, as defined by Ruch (1992), refers to jokes and cartoons in which an element of sense (corresponding to the incongruity resolution component) is anyway present, but the cognitive rule is not a clear-cut one. Nonsense humor can be classified as an intermediate area between incongruity resolution humor and humor based on pure incongruity. Secondly, other factors, such as a tendentious content (sexual and aggressive) or a situational condition–not to mention the social dimension–can be at work, and play such a salient role that it may even put incongruity in the shade. In addition, there are many instances which clearly show that incongruity has to be considered in an interplay of factors. This often functions in synergetic ways, such as when a very aggressive content goes along with a highly incongruous structure, and with a clever incongruity solution: the result is a joke with a high humor potential.

But sometimes incongruity conflicts with other factors. The repetition of jokes is one example of this rather complicated picture. Normally, the repeated exposure to a joke leads to a reduction of incongruity (and related variables such as novelty and surprise), and hence to a progressive (or sudden) extinction of the humorous effect. On the other hand, repetition brings *familiarity*, which in general is a favorable factor, but it is of an opposed nature to incongruity. Zajonc (1968) observed, with a variety of non-humor stimuli, that familiarity by repetition led to an increase in their positive evaluation. It is linked to salience, and a sense of safety. Besides, many comedians have their own favorite line, their recurring gag, which they like to repeat and the audience is willing to hear. Goldstein (1970) found that humor ratings decreased as a function of repetition. But for Ss sexually aroused through a previous exposure to photographs of nude female models (they were asked to rate them on a 5-point scale of "esthetic pleasantness"), the repeated presentation of sexual cartoons led to a significantly less decrease in ratings.

Furthermore, an additional mechanism can be hypothesized, that of a *suspension of knowledge.* In the humor experience, it is commonly accepted that a *suspension of belief and of logic* is (often) required to deal with all the oddities which populate the jokes. A *suspension of sensibility* (Bergson, 1900, called it a temporary anesthesia of the heart) is also necessary to deal with the hostile and cruel content of many funny stories. Seemingly, this ability to filter, and control what otherwise would be the natural and spontaneous reaction, can be exerted also to process a joke *as if* it were heard for the first time, although it is not. This may allow a subject to enjoy the joke again, and maybe again, in particular if relying on some factors like content properties (sexual jokes, for instance), and some preferential target. This speculative hypothesized "suspension of knowledge" may also be at work when a subject is told a joke he actually knows, but he wants to

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pretend that it is new (for instance, due to social interactions), and he reacts accordingly with what he shows, and possibly feels, as a spontaneous, not faked, humorous response (trained actors are a different case).

A number of studies have been dedicated to the many aspects involved in humor and how they interact. As a matter of fact, whatever is relevant to the individual is potentially involved: cognitivity, emotions, instinctual drives, relationships, etc. They all have a part in human and in humor experience.

Among others, one notable example is the line of investigation started by Ruch (1993) using the 3WD Humor Test. The three dimensions measured by the test (Incongruity Resolution, Nonsense, Sexual content) have been studied in relation with various personality traits, such as Sensation Seeking, Conservatism, and Social Attitudes, analyzed also in multi-national settings (see for instance, Forabosco and Ruch 1994; see also Hempelmann and Ruch 2005).

Humor instances, as the result of the combined effects of different factors, are of a wide variety. But, using Eichinger Ferro-Luzzi terms derived from Wittgenstein, we can say that they all share a family resemblance and can be usefully considered in a polythetic-prototype light. Incongruity is *not* an essential element, if it is to be perceived as (always) the most important in achieving a humorous reaction. Instead, it *is* essential in the sense that without incongruity the specificity of a humor experience is missing.

6. The extension dog and the extension of research

From what we have so far gathered, we may answer to the preliminary doubt: we can soundly state that the concept of incongruity is still a useful and fruitful construct for humor investigation. The spiral of questions, answers and new questions, which is the engine and fuel of research, is still going on. Among others, a very good, and paradigmatic, example of its vitality is offered by the ample treatment Marta Dynel (forthcoming) dedicates to incongruity in her in-depth analysis on humorous garden-paths.

Much of the research on humor is projected towards the future, and relies upon rigorous methods of investigation, and on advancements of technology. However, useful inputs of new ideas, contradictory as it might seem, come also from the far past. This does not only mean obtaining hints and inspirations from the large amount of research already carried out. It means also to renew paths of investigation which have been opened, and then unfortunately abandoned. An example may be that of the pioneering work of Lilien Martin who, at the beginning of the last century, published an article reporting an ample and articulated study in the field of the comic. Coincidentally, it was in the same year, 1905, in which Freud published his fundamental book *Der Witz und seine Beziehung zum*

Unbewussten. She also employed the concept of incongruity, though she considered it equivalent to the term "contrast," and in fact preferred to use the latter. She made her study in the perspective of the psychology of aesthetics, examining many different variables in order to establish how they operated so that a given stimulus was found funny, or funnier. In one experiment she used an "extension dog." The paper on which a dog was depicted was cut in two. Then the two parts were arranged in a way that it was possible to move them over each other, making the size of the dog varying in length (from very short to very long). The result was that most of the subjects found the dog funnier both in the very long and in the very short conditions.

Simple as it is (and with all the naivety and methodological shortcomings of the time), it is a very interesting experiment. It confirms the role of incongruity in humor as a diversion from normality (measurable in centimeters), and it suggests a direction for possible experiments. To this purpose, the electronic technology available today represents a resourceful help. It is not maybe redundant to underline that the main asset for an innovative research project is linked to the fantasy-minded researcher who is able to devise imaginative experimental designs, inventing non-customary procedures, and manipulating variables in a creative way.

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