Valerio Cori, Carla Canestrari & Ivana Bianchi

The Perception of Contrariety and the Processing of Verbal Irony

Introduction

It is in everyone’s experience to have heard somebody say “What wonderful weather!” while it was pouring, and to have understood that the speaker was very far from meaning he/she was going to have a picnic. As a result of the contrast noticed between the comment and the situation, the comment is processed correctly as being ironic.

Within the broader field of research exploring how perceptual principles derived from Gestalt psychology may underlie language comprehension (e.g. Bell 1991; Croft & Cruse 2004; Paradis 2008), some specific studies on cognitive mechanisms and pragmatic functions of verbal irony have been inspired by considering perceptual mechanisms (e.g. Colston 2002; Colston & O’Brien 2000b). Our aim is to enrich this perception-based perspective, by suggesting a new way of operationalizing the structure of “contrast” in verbal irony, introducing an as yet unexplored aspect, that is the structure of the perceptual dimension of opposition on which an ironic comment lays.

One of the main results of the studies on the perceptual structure of spatial dimensions such as near-far, long-short, top-bottom, left-right, etc. (Bianchi & Savardi 2008; Bianchi, Savardi et al. 2011) is that these dimensions are perceptually structured in two opposite poles (e.g. top; bottom) and an intermediate region in between them (e.g. neither the top nor the bottom) and that these three components – poles and intermediates – are perceived either as point properties (i.e. single experiences) or as ranges. For example, the at the top-at the bottom dimension is perceived as having two point poles (there is only one way of being at the top and only one way of being at the bottom) and a range of intermediates (there are various positions corresponding to different instances of being “neither at the top, nor at the bottom”). Conversely, the uphill-downhill dimension is perceived as having a point intermediate (there is only one instance of being “neither uphill nor downhill”, namely being on the level) and various different instances of being uphill and being downhill. We will go back to this in detail in one of the next sections. What we would like to emphasize here is that a series of
new questions potentially emerges if one approaches the analysis of the contrast involved in verbal irony comprehension with this issue of the various perceptual structures of dimension in mind. For example, is it possible to comment ironically on an intermediate situation? This is a first new question. Experiencing situations that are intermediates between opposite properties (neither sunny nor rainy; neither hot nor cold; neither near nor far away; neither beautiful nor ugly) is very common in everyday life. As far as we know, studies on verbal irony have almost exclusively focused on contrasting a more or less polarized situation (e.g. it’s pouring/it’s raining) with a more or less polarized comment (e.g. “What wonderful weather!/What nice weather!”). Another new question is whether it is possible to comment ironically using an intermediate statement (referring to a polarized situation). That is, does commenting on an awful rainy day by saying “It’s neither sunny nor rainy today!” sound ironic? Another question is whether the structures of dimensions derived from the various combinations of the extensions of poles and intermediates (points vs ranges) affect the evidence of irony not only when polarized comments refer to opposite polarized situations – as for typical verbal irony – but also when intermediate comments and situations are concerned. These questions stimulate new studies.

The Notion of Contrast in Verbal Irony

Verbal irony has been approached from a variety of viewpoints, but it is widely recognized in the literature that an ironic expression shows an incongruity between what is said and “something else”: an incongruity between the literal meaning and the figurative meaning (e.g. Sperber & Wilson 1981, in Cole 1981, 295ff; for a review, see Dynel 2013, 404ff); an incongruity between the context and the remark (e.g. Gibbs 1986, in Colston & Gibbs 2007, 174; Giora 1999, 243; Giora & Fein 1999, 426; Attardo 2001, in Colston & Gibbs 2007, 157ff; Bryant & Tree 2002, 99; Pexman & Olineck 2002, 247; Ivanko, Pexman et al. 2004, 247; Giora, Fein et al. 2007, 120; Giora 2011, in Dynel 2011, 20); or an incongruity between the context and something that is expected or preferred (e.g. Nakamura, Clucksberg et al. 1995, in Colston & Gibbs 2007, 58; Utsumi 2000, 1783; Kreuz & Link 2002, 128; Kihara 2005, 514). Within this literature, incongruity and contrast are often taken as synonyms.

Contrast has been used with a more specific definition, by Colston & O’ Brien:

“In using the term ‘contrast’ we do not only mean the incongruity of a remark with its referent topic. We additionally refer to the specific effect of the perception or judgment of a topic or event being changed via direct comparison with a different topic or event that varies along some relevant dimension. (...) The potential for such a contrast is greatest when an event is different from what was expected.”

(Colston & O’ Brien 2000a, 1559)
According to these authors, two perceptual mechanisms help to explain the effects of irony: assimilation and contrast. They found that a situation can be perceived more or less negatively, or positively, depending on the kind of contrast created by the speaker by means of his/her comment: when a speaker says something extremely positive of a moderately negative situation, the situation is perceived as much more negative than it actually is. In this case, a contrast effect occurs. Conversely, when a speaker says something moderately positive of a moderately negative situation, the situation is perceived as less negative than it actually is. In this case, an assimilation effect occurs (Colston 2002, 136ff). To put it in terms which are closer to the schema suggested in Figure 1 – which is a slightly modified version of the schema presented in Colston & O’Brien (2000b, 181) capable of including also understatement, whose position has been derived from Colston & O’Brien (2000a) – literal remarks are characterized by describing a situation without moving along the opposite pole of a dimension. If the situation is negative, a remark, to be literal, must be negative as well. Conversely, an ironic remark is characterized by a shift towards the opposite positive pole. In this case, the situation is negative whereas the situation described is more or less positive. This is a contrast of kind (Colston & O’Brien 2000b, 181). A different type of shift is involved in hyperbole and understatement, since in these cases, the shift remains within the same pole of the situation and the contrast involved is a contrast of magnitude. A negative situation is described as being more negative than it actually is in the case of hyperboles, while it is described as being less negative in the case of understatements (Colston & O’Brien 2000b, 180).

Fig. 1 Positions of different types of remark along the continuum of a relevant dimension (e.g., negative-positive) in a given situation (indicated by the X). This diagram is adapted from Colston and O’Brien (2000b, 181).

The examples of verbal irony used by Colston & O’Brien to exemplify these mechanisms concerned situations in which something went wrong and the remarks varied along the negative-positive dimension, and indeed most of the material used in previous studies involves behaviors or events that are judged as positive or negative, good or bad, pleasant or unpleasant, expected or unexpected (e.g. Gibbs 1986, in Colston & Gibbs 2007, 177; Nakamura, Clucksberg et al. 1995, in Colston & Gibbs 2007, 70; Colston 1997, in Colston & Gibbs 2007,

The perspective we are suggesting in this paper is not centered on this evaluative aspect (positive-negative) but has in common with Colston’s proposal the idea of merging perceptual aspects with an investigation on how contrast works in irony. What we are wondering is whether keeping an eye on how dimensions are structured (in terms of topological nature and extension of the poles and of the intermediates) can help to operationalize the contrast needed for an ironic meaning to emerge.

The Phenomenological Structure of Dimensions

The idea of “phenomenological structure of dimensions” or “phenomenological psychophysics of opposites” has emerged in previous studies which have tapped into observers’ direct experience of properties recognized as instances of one pole, as instances of the opposite pole and of the intermediate ‘neither… nor…’ region (Bianchi & Savardi 2008, 49ff; Bianchi & Savardi et al. 2011, 2ff; Bianchi & Burro et al. 2013, 121ff; Bianchi, Paradis et al. in preparation). Four different structures emerged from the analyses of 37 spatial dimensions, defined by the extension and topological characteristics of the poles and of the intermediate region. When a region (pole or intermediate) is perceived as having only one instance, then that region is described as a point; when it is perceived as having many different perceived instances, it is described as a range:

a) PRP (the two poles are two points and the intermediate region is a range)  
b) RPR (the two poles are ranges and the intermediate region is a point)  
c) RRR (the two poles and the intermediate region are ranges)  
d) PNR (one pole is a point, the other pole is a range and there are no intermediates in between the two).

*Top-bottom* is an example of dimensions with a PRP structure: there is only one instance of being at the top of a ladder, only one instance of being at the bottom of the ladder. The remaining positions are perceived as intermediate states, neither at the top nor at the bottom. *Above-below* is an example of dimensions with RPR structure: there is more than one possibility to be either above or below a certain threshold, whereas there is only one possibility to be neither above nor below that threshold (i.e. when one is exactly aligned with it). *Long-short* is an example of RRR structure: there are several possibilities for a street to be long, short, neither long nor short. *Straight-curve* is an example of PNR dimension: there is only one possibility for a column to be perceived as straight; all the others cases are instances of being curved (at various degrees) and there is no intermediate region for this dimension.
How does all this relate to the issue of verbal irony? A situation, an expectation and a remark can be manipulated in terms of these different structures. And one can wonder whether this affects the understanding of irony.

**A Proposal and some Pilot Data**

The study presented in this paper aims to suggest a possible way to address the three questions asked at the end of the introductory section. It explores the effects of the phenomenological structures of opposites in the detection of verbal irony by focusing on two somehow inverse types of dimensions. It answers the question of whether irony is possible also when the situation shows an intermediate state (neither…nor…). It also provides initial answers to the question of whether an ironic statement has necessarily to be polarized or whether an intermediate statement can be understood as ironic as well. To address these questions we manipulated the structure of a dimension, the polarization of the situation referred to and the polarization of the remark (while we controlled the expectations of the speaker by making them explicit and consistent with the remark).

We focused on two dimensions (at the top-at the bottom, uphill-downhill) which have a somehow inverse structure: the former has a PRP structure (two poles perceived as points and an intermediate region perceived as a range of instances), the latter a RPR structure (two poles perceived as ranges, and an intermediate perceived as a point).

We manipulated the Situation at 5 levels: for the PRP dimension (Figure 2), one situation referred to the point pole $A$, another situation referred to point pole $B$, and three different situations referred to the intermediate range ($i_1, i_2, i_3$). For the RPR dimensions (Figure 3), two situations showed different instances of one pole ($A_1, A_2$), two situations exemplified different instances of the opposite pole ($B_1, B_2$) and a situation referred to the point intermediate property ($i$).

![Fig. 2 Manipulation of the situation along the dimension at the top-at the bottom, which has a PRP (point-range-point) structure.](image-url)
We manipulated the remark by considering either a statement pointing to a pole (i.e. “at the top” for the dimension *at the top-at the bottom*; “uphill” for the dimension *uphill-downhill*) or to the intermediate region (i.e. “neither at the top, nor at the bottom”; or “neither uphill, nor downhill”).

Two stories were created, one for the RPR dimension *uphill-downhill*, another for the RPR dimension *at the top-at the bottom*. The stories started with setting a context and making explicit an expectation; then a situation was described (and a drawing was used to represent it) and, finally, a comment was reported. The stories are presented in Table 1.

Five variants of the same story were presented to each participant; what varied was the situation (at the 5 levels described in Figures 2 and 3, respectively). Situation was the variable studied within subjects. Type of dimension (PRP; RPR) and type of remark (polarized; intermediate) were studied between participants.

Table 1 – The four stories used in the study, each one with its 5 variants, relating to the 5 situations. For reasons of space, in the table the 5 situations are listed one after the other. In the study, five different texts of the stories (each one reporting only one situation) were printed on five different sheets of paper. The text of the story was also accompanied by a drawing corresponding to the situation described (the drawings are those reported in Figures 2 and 3).
Method

Participants. 104 undergraduate students of the University of Macerata and the University of Verona participated in the study, divided in four groups (of 26 participants each).

Material. Four booklets of 5 sheets of paper each were used (plus an initial sheet of paper with the instructions). One booklet referred to the story built on the PRP dimension (at the top-at the bottom) and a polarized comment; another to the story built on the PRP dimension (at the top-at the bottom) and an intermediate comment; another referred to the story built on the RPR dimension (uphill-downhill) and a polarized comment; another to the story built on the RPR dimension (uphill-downhill) and an intermediate comment.

In order to control serial effect, two different orderings of the 5 stimuli (5 variants of each story) were used.

Procedure. Each participant was given a booklet. The instructions were printed on the first sheet of paper and read by the experimenter. The instructions made clear that the subject of the study was participants’ perception of irony, and invited participants to read each story and rate whether the final remark was to be intended as ironic or not using a 0 to 10 point scale (with 0 - not ironic at all, and 10 - extremely ironic).
Results

An analysis of variance was conducted on participants’ responses, with Situation as repeated measure variable (at 5 levels) and Statement and Dimension as between-subjects variables (Statement is nested in Dimension). A main effect of Statement (F(2,100)=3.91, p<0.05) and Situation (F(4,400)=85.130, p<0.001) was found, and also their interaction turned out to be significant (situation*statement[dimension]: F(8,400)=48.656, p<0.001).

![Graph showing average ratings of irony for different statements and situations.](image)

As Figure 4 (top graph) shows (and Fisher post-hoc tests revealed), the significant differences between the ratings elicited by the two dimensions concerned the intermediate statement (nn), not the polarized statement (poleA): on average, the intermediate statement commenting on the dimension *uphill-downhill* elicited higher ratings of irony compared to the intermediate statement commenting on...
the dimension at the top-at the bottom (p=0.008). How this relates to the different structure of the two dimensions (RPR the former, PRP the latter) is explained by the significant effect of the interaction (and corresponding post-hoc tests).

The bottom graphs in Figure 4 show (and Fisher post-hoc tests confirmed) that the two statements have a different ironic effect depending on the situation. Let us focus, first, on the difference between the ratings received by the “neither… nor…” statements in the two dimensions, at the top-at the bottom and uphill-downhill (Figure 4, bottom right graph). The difference between the two dimensions concerns one of the poles (poleB), in that the comment “There he is, neither at the top, nor at the bottom!”, referring to the firemen standing at the feet of the ladder, turned out to be less ironic than the comment “neither uphill, nor downhill” elicited by the very steep downhill path (p=0.03). However the difference between the two dimensions concerned also two situations which showed “intermediate experiences”: i1_A1 (p=0.003) and i3_B1 (p=0.03). These last two differences are in the direction predicted by the research hypotheses: for a dimension which has a Range-Point-Range structure (such as uphill-downhill) two situations that are in between the poles but not in the specific point condition that is identified as “neither…nor…” are perceived as instances of the poles. This was expected to be the case for the situations i1_A1 and i3_B1 of the marathon path, that is the situations far from the extremes (A2, B2) but not coincident with being “on level” (i3), i.e. with the point experience “neither…nor…” . Conversely, all the intermediate positions in the ladder (not only the middle one, i3) were expected to be perceived as intermediates and not as representatives of the poles, since at the top and at the bottom are point properties. In agreement with this, the intermediate statement referring to these in-between situations (i1_A1 and i3_B1) turned out to be more ironic when they referred to uphill-downhill in comparison to the other dimension at the top-at the bottom: for the former dimension, a contrast could be seen between the intermediate statement and the situations i1_A1 and i3_B1, which were perceived already as instances of the poles (although weaker than more extreme situations).

Consistent with this different nature of the situations i1_A1 and i3_B1 in the two dimensions is also the difference in irony ratings elicited by the polarized comment in the situation i1_A1 (see Figure 4, bottom left graph). The comment “uphill!” was perceived as not ironic in both the situations showing an uphill condition (i.e. A_A2 and i1_A1), independently of whether the path was more or less steep (the post hoc test between A_A2 and i1_A1 is not significant for the dimension uphill-downhill). Conversely the irony ratings associated to A_A2 and i1_A1 differed significantly for the other dimension at the top-at the bottom (p=0.003). In the latter case there is a qualitative difference between the situation of the firemen standing at the top of the ladder and the situation of the fireman
standing at 2/3 of the ladder: the former is representative of the pole at the top, the second is representative of the intermediate region (he is “neither at the top, nor at the bottom”). And indeed the statement “There he is, right at the top!” was recognized as not ironic in the former situation while significantly more ironic in the second situation.

Altogether, the results described thus far point to the fact that the type of dimension (PRP or RPR) seems to be critical.

Two other results, if we want to go even more macroscopic, emerge from the data represented in the bottom graphs of Figure 4. First, our findings demonstrate that in order for a polarized statement (i.e. a statement referring to a pole) to be understood as ironic, the situation it refers to has not necessarily to show an instance of the opposite pole; also when the situation shows an intermediate state, the statement turns out to be ironic – even though to a smaller extent than when the opposite extreme is involved. This was found for both types of opposites (PRP, RPR).

Second, in order for a statement to be understood as ironic, it has not necessarily to be polarized (i.e. referring to a pole): an intermediate statement can produce irony as well if the situation it applies to is recognized as an instance of the poles. And for the conditions associated with the highest ratings of irony (i.e. when the extreme situations were shown: pB_B2, A_A2) intermediate statements were recognized as being as ironic as more “typical” ironic statements, pointing to the opposite pole (post-hoc tests turned out to be non significant for uphill-downhill, situation B_B2: statement nn vs. statement pole A; at the top-bottom, situation B_B2: statement nn vs. statement pole A).

**General Discussion**

Within the literature on verbal irony, the perceptual structures of the dimension on which an ironic comment plays has not been taken into account. Conversely, the preliminary results presented in this paper suggest that a) this is an interesting variable to take into account, since depending on the perceptual structures of a dimension a comment can be understood as being more or less ironic and b) that intermediates deserve a place in the analyses of irony. In fact, intermediate situations can be addressed ironically by a polarized comment and an intermediate comment can be perceived as ironic when referring to a polarized situation. These results emerged when considering the phenomenological nature of the specific perceptual experiences under observation and do not concern evaluation aspects (positive vs. negative), which are usually referred to in the literature on verbal irony. In this sense the study also suggests that there is room for separating the two variables and analyzing them independently.
The study is clearly not conclusive: we tested only two types of structures (Point-Range-Point and Range-Point-Range) out of the four discovered (Bianchi, Savardi et al. 2011) and only one dimension for each structure (and one scenario for each dimension). Besides these limits that further studies may overcome, our study can be considered as a further example of investigations that connect perceptual studies and language processing. In particular, it contributes to the line of research opened up by Maier (1932) and Schiller (1938), who proposed a Gestalt-based theory of humor comprehension, and known as the configurational approach to humor. According to this approach (Maier 1932; Schiller 1938), a joke is considered as a Gestalt which has an element which looks incongruous to the whole it belongs to. This incongruity stimulates a reconfiguration of the parts of the joke into a new whole, which is the humorous interpretation of the text. According to Metz-Göckel (1989, 2008), the perception of a humorous incongruity breaks the configuration it belongs to, so that the configuration no longer appears closed or complete; when we understand the joke, we resolve this incongruity and restore a harmonic and closed configuration.

Understanding humorous ambiguity has also been explained in terms of figure-ground reversal in bistable images (Russell 1996). The same has been pointed out by some linguists who conceptualized the resolution of a humorous ambiguity in terms of “foreground and background scripts”, referring explicitly to Rubin’s classic vase-profiles (Hempelmann & Attardo 2011, 126, 146; Veale 2008, 76; Viana 2010, 506).

Also the comprehension of humorous cartoons has been explained in terms of perceptual (and in particular Gestalt) principles. Smith (1996) collected a series of examples where the key to humor depends on recognizing proximity, similarity, common fate, and closure between the elements of the drawings. Moreover, as for visual humor, the perceptual configurations used by Michotte to single out the conditions for a causal event to appear have been used to discover their humorous value and the corresponding structural features (Bressanelli & Parovel 2012; Parovel & Guidi 2015).

More specifically, our proposal has been inspired by previous studies that investigated how the cognitive rules underlying the perception of contrariety can help to discover what type of incongruity is better recognized in jokes on sensorial experiences (Canestrari & Bianchi 2012; Canestrari & Bianchi 2013 in Dynel 2013). One of the main results of the studies conducted by Bianchi & Savardi (2008) on the conditions underlying the perception of two objects/events/properties as contrary is the following: by transforming many properties of an initial stimulus into their opposite, we come out with a new stimulus which can be said to be analytically opposite, but which is perceived as different (not contrary) to the initial one (i.e. analytical contrariety). Conversely, the configurations that
have the characteristic of being recognized as contrary are those that are invariant for all other aspects except one, which is contrary in the new figure (i.e. global contrariety). Another important result is that transforming one (or some) property only to an intermediate degree leads to a new stimulus which is perceived as similar to the initial one. The invariance characterizing the two stimuli is too high and the contrast between them is not strong enough to make the two stimuli appear opposite to each other (i.e. intermediate contrariety). By applying these findings to humorous incongruity recognition, Canestrari & Bianchi (2012) found that when the two key elements of a joke are related by means of global contrariety, the incongruity is better and more easily recognized – and the joke ends up being funnier – than when the two key elements are connected by means of an additive or intermediate contrariety. The result that jokes based on intermediate contrariety are perceived as less humorous than jokes based on global contrariety is consistent with one of the findings that has emerged from the study of verbal irony presented in this paper. Given an intermediate situation (e.g. the fireman neither at the top nor at the bottom of the ladder), a polarized comment (e.g. “right at the top!”) was perceived as less ironic than the same comment applied to the opposite situation (e.g. the fireman is at the bottom of the ladder). A similar cognitive rule seems to be in action in the two cases. The research project on perception of contrariety and verbal irony processing is still at its beginning, but it seems promising.

Summary
Several studies on verbal irony agree on the fact that in order to comprehend the ironic value of a comment a contrast has to be detected (e.g. Colston, O’Brien 2000a, 2008b; Giora 1995; Giora et al. 2005; Kreuz & Link 2002). “Contrast” is defined more or less implicitly as the gap or distance between two ends of a dimension. Questions have been raised as to how different “distances” relate to different levels of irony (whereas the absence of distance characterizes literal comments). The study presented in this paper suggests a new line of research a) by exploring whether and how the phenomenological structure of the properties that are in contrast impacts on the cognitive distance perceived (and thus on recognition of irony) and b) by analyzing the role not only of polarized but also of intermediate situations and statements. The results are promising: they suggest that intermediate situations can be addressed ironically by a polarized comment and that an intermediate comment can be perceived as ironic when referring to a polarized situation.

Keywords: Verbal irony, contrast, incongruity, contrariety, cognitive linguistics.

Zusammenfassung
“Abstände” sich auf verschiedene Ebenen der Ironie beziehen (während hingegen das Fehlen eines Abstands wörtliche Kommentare kennzeichnet).

Die Studie, die hier präsentiert wird, schlägt eine neue Forschungslinie vor, und zwar a) zu untersuchen, ob und wie sich die phänomenologische Struktur der im Widerspruch zueinander stehenden Eigenschaften auf die wahrgenommene kognitive Distanz auswirkt (und damit auch auf das Erkennen von Ironie), und b) nicht nur die Funktion von polarisierten, sondern auch die von mittleren Situationen und Aussagen zu analysieren. Die Ergebnisse sind vielversprechend: Sie deuten darauf hin, dass mittlere Situationen durch einen polarisierten Kommentar ironisch angesprochen werden können, und dass ein mittlerer Kommentar als ironisch wahrgenommen werden kann, wenn er auf eine polarisierte Situation bezogen ist.


References

Bressanelli, D. & Parovel, G. (2012): The emotional effect of violation of causality, or how to make a square amusing. *I-Perception* 3, 146-149.


Valerio Cori (b. 1985), Bachelor Degree in Science of Communication, Master Degree in Philosophical Sciences, is currently PhD student in Psychology, Communication and Social Science at the University of Macerata, Italy. His main research interests are in psychological theories of humor.

**Address:** Department of Education, Cultural Heritage and Tourism, University of Macerata, P.le Luigi Bertelli, 62100, Macerata, Italy. E-mail: v.cori@unimc.it

Carla Canestrari (b. 1976), Ph.D., is assistant professor of General Psychology at the University of Macerata, Department of Education, Cultural Heritage and Tourism (Italy). Her main scientific and research interests concern the analysis of humorous interactions and the cognitive processes involved in humour and irony comprehension.

**Address:** Department of Education, Cultural Heritage and Tourism, University of Macerata, P.le Luigi Bertelli, 62100, Macerata, Italy. E-mail: carla.canestrari@unimc.it

Ivana Bianchi (b. 1971) is associate professor of General Psychology at the University of Macerata, Department of Humanities (Section Philosophy and Human Sciences), Italy. She is working in the field of experimental phenomenology of perception, in particular on perception of opposition between visual stimuli, on mirror perception and on methodological issues concerning experimental phenomenology (such as inter-observation).

**Address:** Department of Education, Cultural Heritage and Tourisim, University of Macerata, P.le Luigi Bertelli, 62100, Macerata, Italy. E-mail: ivana.bianchi@unimc.it