Bulletin of the *Transilvania* University of Braşov
Series IV: Philology and Cultural Studies • Vol. 7 (56) No. 1 - 2014

Irony as complexity scaffold for deep learning

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In Feller (2008) I have argued that irony can be used to motivate people to take a specific course of action. Based on my findings, this paper looks into the effects irony can have on someone's mental actions. More precisely, I argue here that ironic expressions can be used in learning interactions to promote deep learning. Under certain circumstances, it can serve as complexity scaffold in the sense that the learner is prompted into thinking along more complex schemas. Following Chi and Ohlsson's (2005) psychological framework for deep learning, I illustrate how irony facilitates the learner's arriving at new insights by re-representing her knowledge in certain ways. I will demonstrate on the back of selected examples of quasi-authentic learning interactions from the US television show House, M.D. how this works.

Key-words: *irony, Dialogic Action Games, Explorative Action Games, dialog, knowledge re-representation, deep learning*

1. Introduction

Irony has been subjected to investigation against the backdrop of various standpoints in linguistics. In the following section I will discuss a few selected examples and show why the notions of irony they promote fall short of what is going on in dialogic language use. It lies beyond the scope of this paper to discuss all existing approaches, as there are too many; however, I believe that the selected examples give a fair overview of the issues at stake. I chose two approaches, the Standard Pragmatic Model and the irony-as-echo model, which I compare to the basic assumptions of Weigand's (2000, 2010) theory of Dialogic Action Games, a theory of natural, dialogic language use. In the next step, I sketch a model for learning interactions in terms of what I call explorative action games and connect this model to deep learning defined along the revised Bloom's taxonomy and Chi and Ohlsson's (2005) types of knowledge re-representation. In the remainder of the paper, this theoretical framework is applied to the analysis of selected quasi-authentic dialogs from the US television series *House, M.D.* I conclude the paper with a brief discussion of my findings and questions for future research.

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2. Traditional approaches to irony vs. the theory of Dialogic Action Games

Following Weigand's (2000, 2010) theory of Dialogic Action Games (DAG), I hold that the speaker and the hearer carry out actions when they communicate with each other. More precisely, the speaker carries out communicative actions like ordering, requesting, stating, and questioning, to name a few. The hearer, on the other hand, reacts to the speaker's communicative action. For example, she complies, rejects, replies, provides information, withholds information, agrees or disagrees. Every action in the game is mutually related to another action. It is this pair of action and reaction which forms the minimal communicative unit in dialogic language use.

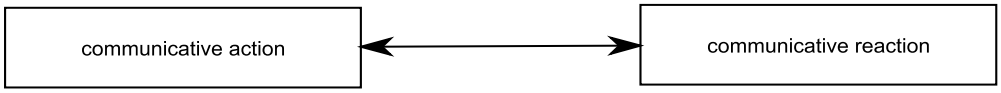


Figure 1. The minimal dialogic action game. This figure illustrates the minimal unit of communication consisting of communicative action and reaction. As indicated by the double arrow, action and reaction are mutually related.

Let us take a closer look at the action notion behind the DAG. What is the meaning of action here, i.e. what do the speakers do when they act in the DAG? Weigand defines action closely to practical reason: the speaker has a specific communicative purpose and seeks suitable communicative means for fulfillment. The set of available communicative means is thereby quasi open-ended. The DAG runs along principles of probability where speakers act on the basis of conventions. Conventions, as against strictly defined rules, are bendable. The speaker can always change conventions *ad hoc*, keeping the communication up and running. This becomes immediately apparent in the language use of younger children aged around 3 to 5. It is fascinating how easily they browse through communicative means and often amend them to their needs with a view to making themselves understood. My son, aged 3, told me the other day that he wanted to "do beep" for a toy with his Chuggington. I was puzzled until he showed me his little wallet with a cartoon train and the name "Chuggington" printed on its front cover. He told me that we should go to the counter, so that the lady would "do beep". I understood that what he was referring to was scanning the price tag, so that he could pay for the toy. Although my son's language use was rather creative, we understood each other. Our communication was successful.

The action principle can thus be represented as follows:

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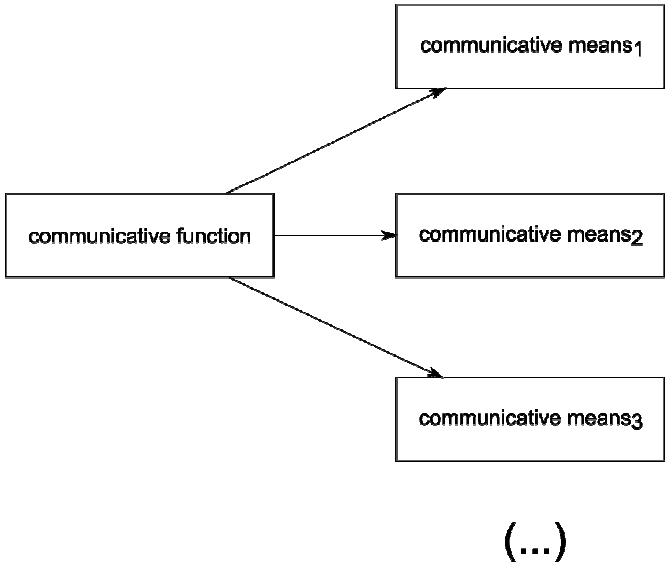


Figure 2. The action principle. The speaker applies specific communicative means to fulfill her communicative functions. The means side is potentially open-ended.

Returning to the initial topic of this paper, I have elsewhere already compared a number of theories of irony against these two basic ingredients of natural language use: dialogicality and action. For the sake of argument, let me again discuss here two well-known examples: the Standard Pragmatic Model (SPM) (Grice 1975, 1978; Searle 1978; cf. also Attardo 2000; Booth 1974) and the use-mention distinction or irony-as-echo view (Sperber and Wilson 1981; Wilson 2006).

The SPM claims that an ironic utterance conveys two opposing meanings: I call them the surface meaning and the intended meaning. The surface meaning is the quasi-literal meaning of the utterance, while the intended meaning is, according to SPM, the exact opposite of it. The intended meaning is thereby triggered by specific contextual cues, which deem the literal meaning nonsensical. Consider the following example:

1) *You are so smart.* [Imagine this utterance by a physics teacher directed at John, one of her students, who answered *You ask your teacher* after she asked him how to do a voltage reading.]

According to SPM, the context of 1) tells us that the literal meaning of the utterance should be changed; more precisely, it should be changed to the opposite, which is achieved by simply replacing "smart" with "stupid". The contextual cue is thereby inherent to the school context and what one would usually expect as a 'normal' reaction to the teacher's question. In this case the compliant student would

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'normally' explain the correct procedural outline of a state-of-the-art voltage reading, or make at least an attempt to do so. John's blunt violation of this expectation supposedly tells us that 1) should be reinterpreted as ironic.

There are, however, a number of issues that SPM raises. For example, why would the teacher "hide" the intended meaning behind the surface meaning? Firstly, encoding the intended meaning into the surface meaning means extra effort for the speaker just like decoding does for the hearer. In addition, decoding always runs the risk of misinterpretation. There is no guarantee that the hearer will get the irony and hence reinterpret the utterance accordingly. Well, one obvious reason for making the effort might be hedging. The speaker might simply want to mitigate the negativity of the surface meaning. Regarding our example, the teacher might want to avoid insulting and embarrassing John by calling him stupid in front of the whole class. But there are many counterexamples where hedging is, if at all, only of limited concern. An utterance like

2) *The perfect weather for a walk.*

which the speaker mentions to herself while it is actually raining cats and dogs outside, is not used for hedging. Other difficulties arise from the fact that sometimes there is simply nothing to be replaced by its opposite. Consider an utterance like

3) *France in a bottle.*

uttered by a wine connoisseur who just tasted a horrible French wine. The SPM cannot explain ironic utterances of this kind.

In response to these and other shortcomings of SPM, Wilson and Sperber (1981) formulated the irony-as-echo model. According to them, when using irony, the speaker echoes a previously used utterance, conveying a more or less negative attitude towards the original source. In this sense, the reason for 1), 2) and 3) to be interpreted as ironic is that the speaker recites them in a context that proves the source's original utterance to be inappropriate or irrelevant.

Clearly, the irony-as-echo view has some advantages over the SPM; at the same time, some things remain rather vague: for example, how can the original source be identified? What form does it have? Is it an utterance, a thought, a commonly held view? Wilson and Sperber (1981) allow for all sorts of sources including sources of "vaguer origin", which also include "an imagined one" (309-100). I hold this to be not very convincing and believe that in many cases of irony, the speaker has actually no source whatsoever in mind. Anyhow, there is still the question as to why the speaker does not explicitly indicate her mentioning of the original source then. Not indicating the citation character of the ironic utterance bears the risk of misinterpretation: the hearer might mix up the mentioning by the speaker with her using the utterance in a direct way.

Further to the problems mentioned above, it shows that neither view of irony makes any reference to dialog or action. The ironic utterance is interpreted as if it were isolated from natural language use.

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There must be another take on irony, which gives us a better explanation of why and how speakers use it.

3. Irony as communicative action in dialog

In Feller (2008), I have sketched a view of irony as a rhetorical device for motivation. I call this view here irony-as-motivation. What does this mean exactly? Well, it means that the speaker uses irony to motivate the hearer to take a desired course of action. This makes only sense if we widen the scope of investigation from the utterance level to the level of the Dialogic Action Game (DAG). In the previous section, I have already presented two basic DAG ingredients: dialogicality and action. But there is another aspect of the DAG, which is of paramount importance for a better understanding of irony: culture. Weigand already defines the DAG as a cultural game. In more detail, this means that both speaker and hearer interact with each other against the backdrop of culturally entrenched norms and value systems. For example, in many Western cultures, we find values including individual freedom, altruism and democracy, among others. How the interlocutors construct meaning and interpret utterances is largely dependent on these cultural factors.

The cultural DAG is the starting point for the irony-as-motivation view (henceforth IMV). In the IMV, an ironic utterance contradicts the underlying culture of the DAG. The hearer detects this contradiction and is prompted into resolving the imbalance. This can thereby take on multiple different forms like changing one's attitude or mental perspective and carrying out a communicative or physical action. In other words, irony triggers the hearer's reaction by creating a tension between the interlocutors' cultural values and the meaning of the ironic utterance. Consider Figure 3

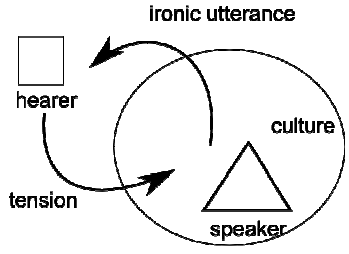


Figure 3. Irony-as-motivation. The speaker (represented by the triangle) uses an ironic utterance (top arrow), which points to a discrepancy between the hearer's behavior and the cultural system (circle) underlying the dialog. As a result, the hearer (square) experiences the need (bottom arrow) to change her behavior with a view to complying with the cultural system.

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Still the question must be posed why the speaker uses irony instead of just directly requesting the hearer to react in the expected/desired way. A strong candidate for an explanation comes from Self-Determination Theory (SDT) (Deci and Ryan 1985, 2000), a theory in psychology. SDT holds that every individual has three basic needs: autonomy, competence and relatedness (henceforth ACR). In more detail this means that we all want to make our own choices, be free in our decisions, be capable to solve the problems we, as well as be respected and acknowledged by others. There is an enormous fund of literature in educational science (cf., among others, Etemadzadeh, Samira and Far 2013; Gee 2005; Grolnick and Ryan 1987) pointing to the positive effect of ACR support for learning performance. One of the main arguments revolves around the concept of internalization. Internalization of activities goes hand in hand with intrinsic motivation. The learner engages in learning activities for the sake of the activities themselves and not for some external reward or goal like high test scores or a promised visit to Disneyland. Catering the learner's ACR needs facilitates internalization and intrinsic motivation. For example, a number of studies have shown that autonomous learners have a much deeper understanding of the content presented to them than learners that are restricted in their autonomy. Similarly, it has proven that dialogic and collaborative learning in groups helps learners grasp material more profoundly and work out more creative solutions than by learning from textbooks, for instance.

I hold that irony-as-motivation supports the hearer's ACR needs and thus facilitates internalization and intrinsic motivation in the hearer. It is in the end the hearer who reduces the tension created by the ironic through her own action. The speaker does not directly request/order the hearer to act in a certain way. It is the hearer herself who makes the request/order to herself. The intrinsic motivation results from the experienced tension which, by pointing to culture, taps a core component of the hearer's personality. The created tension is powerful and converts readily into the intrinsic motivation required to carry out the expected change in behavior. It is important to note that, as mentioned before, behavior includes physical as well as mental action. The following sections discuss these points in more detail with a special focus on education in general and learning interactions in particular.

4. Explorative Action Games

In order to look more closely at the role of irony in learning interactions, and here especially deep learning, we are in need for a conceptualization of learning interactions. I have elsewhere (2013, 2014) put forward a dialogic model of learning interactions which I call Explorative Action Games (EAGs). The basic conceptualization of EAGs

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goes back to Weigand's DAG. The minimal EAG is also a dyad of speech acts: I call them 'explorative' and 'discover':

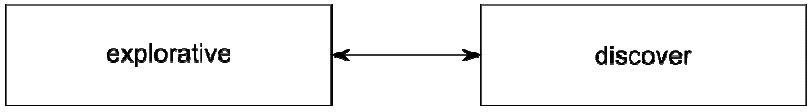


Figure 4. Explorative Action Game (EAG). The EAG consists of the mutually related speech act pair 'explorative' and 'discover'. The EAG instantiates learning through knowledge re-representation.

Similarly to Searle's (1969) formula F(p), both the explorative and discover speech act consist of a speech act function F and a propositional act p. In addition, the speech act function of each speech act is directed towards a particular type of knowledge change. Chi and Ohlsson (2005) describe different types of knowledge change for deep learning. I will give more detail in the next section. The explorative speech act has as its function "explore a topic". Thereby, the propositional act in round brackets presents the topic which ought to be explored. The "how", i.e. the kinds of cognitive strategies used for exploration, is indicated by the type of change given in square brackets. On the other hand, the illocutionary function of the discover speech act is to gain new insights into a topic through changing, i.e. re-representing knowledge. The propositional act in round brackets refers to the knowledge re-representation, i.e. the learning outcome, while type of change in round brackets indicates the type of reasoning applied in the process of re-representation. It is important to note that the discover speech act is not necessarily realized verbally. The hearer might react to the speaker's explorative in non-verbal ways. As will be discussed later on, the explorative might cause the hearer to change her viewpoint. The hearer might communicate this change either verbally, non-verbally, for example through a specific physical action, or, likewise, not at all. The types of change in both speech acts match with each other, as both speech acts are mutually related to each other.

Furthermore, the EAG just like the DAG is embedded in a specific cultural context. The interlocutors communicate against a given background of cultural norms and values. The norms and values in the educational world overlap with the basic cultural system in a society to a very large extent, but they are further shaped by how learning actually takes place. In other words, we are dealing here with a sort of subculture. Even within one cultural group there might exist different learning environments, for example, regarding the teacher-student ratio, learner vs. teacher-centeredness, skill-based vs. content-based learning, and the integration of technology, to name a few that come with their own specific values and norms. I do not want to dwell on this point in too much detail, as this would exceed the scope of this paper. However, it is an important point to keep in mind: since irony-as-

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motivation works on the basis of the cultural system, any differences across systems are expected to yield different outcomes/effect for the use of ironic utterances. This is one of the reasons why in some cases irony works and in others it does not.

Having arrived at a working conceptualization for learning interactions in terms of the EAG, I will now present a more detailed account of learning based on Chi and Ohlssons's (2005) types of knowledge re-representation.

5. Learning via knowledge re-representation

How can irony be used to scaffold the learner's deep learning? Having established a conceptual ground for learning interactions and having argued that, beyond traditional views, irony is a communicative action in dialog which triggers change in the hearer's mental and/or physical behavior, it is now time to say a little more about deep learning.

Bloom's (1956) taxonomy is seminal in this regard and the revised version by Krathwohl (2002) is an important reference in modern educational science and practice alike. The revised taxonomy lists different types of reasoning, which are ranked according to the level of learning they occur on. I argue that the distinct types of reasoning are arranged along a learning continuum of cognitive strategies with the two endpoints endocentric and exocentric reasoning. While endocentric reasoning refers to cognitive strategies by which the learner mainly analyzes existing knowledge, exocentric reasoning involves processes of knowledge re-representation that result in new complex conceptualizations. It is especially the two types of reasoning 'evaluate' and 'create' in the taxonomy, which belong to the exocentric end of the learning continuum. Consider Figure 5:

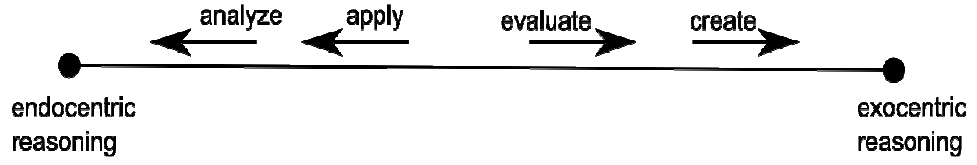


Figure 5. The learning continuum. Types of reasoning like 'analyze' and 'apply' are mainly endocentric, i.e. the learner does not go beyond her existing knowledge. On the other hand, 'evaluate' and 'create', among others, are types of reasoning with the help of which the learner synthesizes new conceptualization beyond her existing knowledge.

These two exocentric types of reasoning are thereby defined as follows:

- evaluate – Making judgments based on criteria and standards.

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• create – Putting elements together to form a novel, coherent whole or make an original product.

With the help of Chi and Ohlsson's psychological framework we can add further detail to how 'evaluate' and 'create' are actually instantiated. The authors view learning in terms of different types of knowledge re-representations. In the context of this paper, it is especially the two re-representations 'higher level of abstraction' and 'shifted vantage point' which are of interest, as it is these two types which correlate with 'evaluate' and 'create':

• higher level of abstraction: with increasing expertise the learner tends to represent a problem at a higher level of abstraction. At this abstraction level, thinking runs along deep principles and generalizations rather than concrete surface components.

• shifted vantage point: changing one's perspective is another psychological process which adds new information to one's knowledge base and thus scaffolds learning.

Following both Krathwohl's and Chi and Ohlsson's frameworks, deep learning takes place in processes of evaluation and creation, in which the learner makes criteria-driven judgments or synthesizes information into new complex conceptualizations. But what is now the role of irony in all this? The following section sheds light on this question.

6. Irony as complexity scaffold

In contrast to the SPM and the irony-as-echo view, I hold that irony has a thoroughly dialogic function in natural language use. The speaker uses irony to motivate the hearer to act in a certain way. As mentioned before, "act" is understood here in a very loose sense including physical as well as mental actions. Having arrived at a conceptualization of learning interactions in terms of EAGs, we are now in a position to further explore how irony can be put to use for deep learning, i.e., more precisely, how it can be used to make the learner re-represent knowledge in complex and meaningful ways.

Taking as a starting point the EAG and herein the explorative speech act, we arrive at the following function-means correlation for irony:

a) explorative [higher level of abstraction] (topic) □ ironic utterance

As a) illustrates, irony is on the means side of the function-means correlation. The ironic utterance is a means to instantiate the explorative speech act as demarcated on the left side of the figure. Similarly, b) captures the correlation for the explorative around the second type of knowledge re-representation mentioned earlier:

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b) explorative [shifted vantage point] (topic) □ ironic utterance

The discover speech act correlating to a) is:

c) discover [higher level of abstraction] (knowledge re-representation)

As for b), the discover speech act is:

d) discover [shifted vantage point] (knowledge re-representation)

We thus arrive at two types of EAGs. Compare Figures 6 and 7:

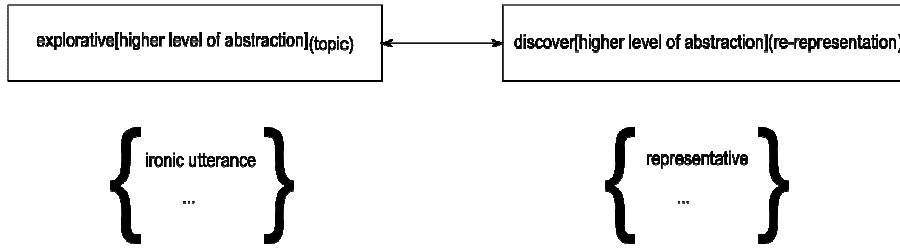


Figure 6. EAG type I. The ironic utterance is used as a communicative means for instantiating the explorative speech act. The explorative is directed towards the type of knowledge re-representation 'higher level of abstraction'. The reactive discover speech act can be instantiated by a representative speech act, among others. For both speech acts, the set of communicative means available is potentially open-ended.

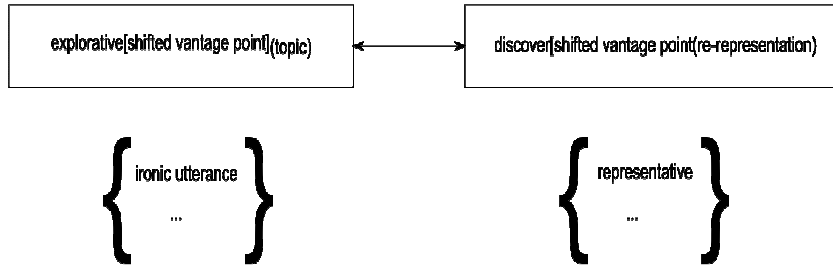


Figure 7. EAG type II. The ironic utterance is used as a communicative means for instantiating the explorative speech act. The explorative is directed towards the type of knowledge re-representation 'shifted vantage point'. The reactive discover speech act can be instantiated by a representative speech act, among others. For both speech acts, the set of communicative means available is potentially open-ended.

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The following section presents selected examples that give us a better understanding of how this looks like in practice.

7. Irony in action: Selected examples

For illustration purposes, I will refer to selected examples from the US television show *House, M.D.* The main reason for this is the frequent use of irony by the main character of the show, Gregory House, M.D. The selected dialogs portray quasi-authentic learning interactions: House leads a team of early career diagnosticians. It is obvious from the dynamics of the dialogs that the interlocutors are in a mentor-student relationship, with House being the mentor and the young team members in the student role. Although, the examples are all fictional, they portray close to real-life situations. All examples feature language use with high degrees of plausibility and believability and are thus suitable to serve as a data pool for the analysis.

The examples have been chosen by hand, at my own discretion. I have browsed through a collection of dialogs at http://www.imdb.com/character/ch 0015927/quotes (last date of access, 7 May, 2014) and have selected two dialogs in total: one dialog for each type of EAG illustrated by Figures 6 and 7).

EAG type I: Higher level of abstraction

Here follows the first dialog for the first type of EAG featuring the knowledge re-representation type ‘higher level of abstraction’. House and his team members - Dr. Cameron, Dr. Foreman, and Dr. Chase - treat a 9-year-old girl with terminal cancer who is suffering from hallucinations:

House: Oxygen saturation is 94%, check her heart.
Foreman: Her oxygen saturation is normal.
House: It’s off by one percentage point.
Foreman: It’s within range. It’s normal.
House: If her DNA was off by one percentage point she’d be a dolphin. We’ve got a patient, who for no obvious reason is hallucinating. Since it’s not obvious, I thought we’d go with subtle.
Cameron: It doesn’t matter. If her sat percentage is off that means her blood isn’t getting enough oxygen. That’s a problem with her lungs not her heart.
Foreman: A lung problem isn’t causing hallucinations.
Chase: But the lungs could lead us somewhere that is.
House: Welcome to the end of the thought process

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It is House's utterance in lines 5-8 which is of special interest to us. This is clearly an ironic utterance. At first sight, House does not seem to contribute much to the problem-solving process here. However, at a closer look at what follows in the dialog, the picture changes. With his ironic utterance, House implies that in special circumstances little things might make a big difference and that a 1% decrease in oxygen saturation might actually be important in the given case. Cameron's reaction in lines 9-11 is an important step towards finding an answer to why the patient is hallucinating. While in line 4 Foreman rejects House's assessment on the oxygen saturation being off, Cameron now follows up on this point. Cameron's suggestion that it might be rather the lungs that cause the problem than the heart, which House suggested in line 1, triggers further reactions by Foreman and Chase. Both reconnect Cameron's idea to the initial problem, the hallucinations (lines 13 and 14). The line of reasoning from Cameron over Foreman to Chase thereby clearly shows an increasing level of abstraction. Starting off from a simple conceptualization connecting an abnormal oxygen saturation to a problem with the patient's lungs, the reasoning becomes increasingly exocentric. After House's ironic utterance, the three young doctors combine this simple schema with the seemingly disconnected condition of having hallucinations. Chase is the one who ultimately makes the connection, arriving at the insight that the lungs might indirectly indicate where the real problem lies (line 13). It is thus the combining and re-representing of, at first sight, disconnected simpler conceptualizations to a complex whole, which opens up a new take on the situation leading the team one step ahead in the problem-solving process.
Let us consider a second dialog that fits this type of EAG.

EAG type II: Shifted vantage point

The episode from which this dialog is taken deals with an interracial couple. The wife is hospitalized, as, after having been attacked by robbers, her airway closes and she collapses. During her treatment, the husband begins to experience severe stomach and chest pain. House and his team first suspect a shared infection or a shared environment to cause the conditions. However, both possibilities are excluded by a series of tests.

1	House:	Kids talk about running off, not many do it. What was the
2		reason?
3	Foreman:	They were trying to escape his evil, pill-popping, racist dad.
4		You would have liked him. We should do another biopsy.
5	House:	How'd you know the dad was racist?
6	Foreman:	He beat up his son for dating a black girl. Extrapolated from
7		that –
8	House:	You see racism everywhere. Maybe he just didn't like this
9		black girl.

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10	Cameron:	It's not sarcoid. We would have seen granulomas in
11	House:	She has pretty eyes. Forget infectious. Forget environmental.
12		Defective DNA is keeping them from making a critical
13		protein, hence the fluid build-up. Hits the throat, stomach,
14		chest, and brain.
15	Cameron:	Angioedema?
16	House:	Hereditary Angioedema. Symptoms fit perfectly.
17	Chase:	It's an incredibly rare disease. They would both have to have
18		a parent
19	House:	Is it a coincidence that your sister has great hair, or that these
20		two have green eyes?
21	Foreman:	You're not saying… they're not brother and sister?
22	House:	Ew, God, no! That would be sick. Half-brother and sister.
23		Different moms. Dad must have had an affair with her mom.
24		That's why he flipped out when the kids started dating, he
25		had it himself, probably why the pills.

In this example House uses an ironic utterance in lines 8 and 9. And once again, just like in the previous example, this utterance triggers a line of reasoning, in which the interlocutors re-represent their knowledge. They create complex conceptualizations which ultimately lead them to the problem solution.

How does this work, though? With his ironic utterance House shifts the vantage point from the medical conditions to the social relations between and around the two patients. His irony targets Foreman's belief that the husband's father is a racist, since he beat up his son for dating a black girl (lines 6 and 7). House's utterance implies that this kind of stereotyping often leads to false conclusions and that a shifted vantage point away from such generalizations might lead to the solution of the problem.

Chase takes this point up in his utterance in lines 17 and 18: "They would both have to have a parent". House affirms Chase's suggestion by mentioning common features in the phenotype shared by both patients, which is rather odd for an interracial couple: the green eyes. In line 21, Foreman connects the dots. He has strong doubts that the couple is in fact biological brother and sister, which is reflected by his phrasing the conclusion as a question. Nevertheless, he views the problem from this new vantage point and does not reject the possibility *per se.* It is then House who puts Foreman's thoughts into perspective in lines 22 to 25, assuming that they are likely to be half-brother and sister.

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8. Discussion

The previous analysis of two selected dialogs from the US television show *House, M.D*. has revealed how irony can be used to facilitate types of reasoning which correlate with deep learning. As discussed earlier, in both cases, i.e. in the EAG type I and II, the speaker uses an ironic utterance to point out the tension between the hearer's behavior including her mental actions and thoughts, and the cultural background, in which the dialog takes place. This tension creates a need in the hearer to change her behavior accordingly. The ironic utterance thereby suggests a cognitive strategy, i.e. a specific type of knowledge re-representation that the hearer should apply. In EAG type I, re-representation is instantiated through increasing the level of abstraction, i.e. by combining simpler conceptualizations to a complex whole. In EAG type II knowledge is re-represented by shifting the vantage point, which opens up a completely new take on the given problem.

In both dialogs, the re-representation of knowledge is triggered in an ACR supportive manner. The ironic utterance only scaffolds the hearer's behavioral change. It is the hearer herself who reduces the tension between her current behavior and the underlying cultural values and norms. In this way, the hearer remains autonomous and perceives herself as competent, as the scaffolding facilitates important mental steps in the problem-solving process. Working the solution out herself, the hearer's participation in the process is intrinsically motivated. She is furthermore more likely to internalize the problem-solving steps and thus memorize them as cognitive strategies for the future.

As mentioned before, another essential ingredient for irony-as-motivation is culture. Learning interactions in terms of EAGs are always culturally shaped interactions. Culture is used here in the broad sense including societal, institutional, professional and also personal norms and value systems. In the two analyzed dialogs, we find a combination of two different cultural levels: the interlocutors act mainly against the background of societal and professional norms and values. In EAG type I, the irony applied by House points to professional norms of best care and attention for detail. In EAG type II, it draws upon societal norms of equality, anti-discrimination and anti-stereotyping.

9. Conclusion

In this paper, I have illustrated a dialogic communicative function of ironic utterances, which I call irony-as-motivation. This function becomes apparent only if we open up the scope of investigation to natural language use in dialogic interaction. I have conceptualized dialog in terms of Weigand's DAG. The DAG is a cultural game which is of paramount importance to the irony-as-motivation view, as culture

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is a necessary condition for irony-as-motivation to come into existence in the first place.

I have applied my view of irony to learning in general and learning interactions in particular, arguing that irony-as-motivation can be used to prompt the learner into deep learning. Deep learning has been conceptualized along Chi and Ohlsson's psychological framework as types of knowledge re-representation. In accordance with the revised Bloom's taxonomy and the top two types of reasoning correlating with deep learning, namely 'evaluate' and 'create', I focused on two specific types of re-representation: 'higher level of abstraction' and 'shifted vantage point'. The analysis of two quasi-authentic learning interactions from the US television show *House, M.D.* illustrated how irony-as-motivation scaffolds the learner's thinking and prompts her into re-representing her knowledge by forming complex conceptualizations of a given problem, which adds significantly to the problem solution. Irony has thus a genuinely dialogic function, which taps on the interlocutors' culture.

The claims that I make here are, of course, all theoretical and require further verification. To see if irony-as-motivation really works in real-life situations can only be judged against real-life situations. This said, experimental studies in real learning interactions with real participants should look into the effect and use of irony in this way. It should also be obvious that irony, in all its complexity, requires a look beyond the verbal level. Instead, different levels of communication and language use should be integrated with a view to arriving at a better understanding of ironic functions. Linguistics should team up with neighboring disciplines like psychology, philosophy and neuroscience, among others, to gain new insights in this regard. Combined future research will certainly shed more light on these issues.

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