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Logic

A Logical Vacation

Julia Nefsky on the curiously strong connections between logic and humour.

What would you say if I asked you to *describe* humour? What type of 'thing' is it? Perhaps you'd say that humour is a form of entertainment and creativity. Humour is colourful and free, unbounded by rules and norms. Humour is lively. It has personality; in fact, it takes on all kinds of different personalities. Humour is tied with one's emotions – happiness, delight, hilarity... laughter.

Now, describe the nature of logic. What type of 'thing' is logic? Perhaps you'd say that logic is a mathematical system. Logic is cold, serious and strict. Logic is bound by rules. Logic is a very intellectual field of study. Logic is a systematic part of reasoning, specifically meant to leave out emotions.

These descriptions of humour and logic may be largely true, and may imply something fairly accurate about the degree to which each appeals to the general population. It seems to follow from conceptions like these that logic and humour must be involved with two very different spheres of the mind. After glancing at their apparent nature, logic and humour seem to be totally unrelated.

However, despite their opposite images when considered apart, logic has a very real and very important role in humour.

Take the following part of a Monty Python skit in which an accountant is addressing the board of a company:

Accountant (Wilkins): "This firm last year made a complete profit of a shilling."
 Chairman: "A shilling, Wilkins?"
 Accountant: "Roughly yes, sir."
 Chairman: "Wilkins, I'm the chairman of a multi-million pound corporation and you are a very new chartered accountant; isn't it possible there may have been some mistake?"
 Accountant: "That's very kind of you sir, but I don't think I'm ready to be chairman."

What makes this funny? Oddly enough, the core of the humour here is related directly to logic.

So, now we're going to take a look at logic outside of its usual purely theoretical field and inside the sometimes clever, sometimes silly, sometimes outrageous field of humour. This is about logic on vacation – one of the many things logic does when it is not being struggled with in classrooms and university offices.

What Logic?

I am going to talk about three specific areas of logic: formal logic, formal fallacies, and informal fallacies. Formal logic is concerned with distinguishing between valid and invalid arguments. A valid argument is such that if you accept the premises (which are the assumptions being made) then you must accept the conclusion. What makes an argument valid or invalid is its form and not its content. One of the simplest examples of what formal logic considers to be a valid argument is what is called *Modus Ponens*, which is:

If A then B (premise 1).
 A is true (premise 2).
 Therefore B is true (conclusion).

No matter what you fill in for A and B, this will always be a valid argument.

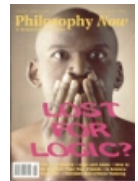
A logical fallacy is a mistake in logic; part of knowing logic is knowing when a mistake has been made. *Formal* fallacies are common errors in formal logic – they are invalid arguments that may appear to many people to be valid. Finally, *informal* fallacies are mistakes in reasoning that can occur in valid or invalid arguments and are related to content. An informal fallacy can account for why a conclusion is not true even

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though the argument form is valid.

What Humour?

The range of humour in which there is logic and logical fallacy is *huge*. By logic and fallacy being *in* humour I mean that there is some logic or fallacy there that is necessary to what makes it funny. In other words, if you hypothetically removed that logic or fallacy, the joke would not work. You'll find logic and logical fallacies in all kinds of humorous works, including those of Shakespeare, Lewis Carroll, Monty Python, the Marx Brothers, Abbott and Costello, Woody Allen, Mel Brooks, Steve Martin, Stephen Leacock, Douglas Adams, and even television shows like *Beavis and Butthead*. Also, logic and fallacies are used in many different comics, including *Garfield*, *Calvin and Hobbes*, and *Peanuts*. And there are lots of great examples in the work of stand-up comedians like Jerry Seinfeld, Bill Cosby, George Carlin, and Henny Youngman. In fact, basically everywhere you look in humour there will be some bits in which logic or fallacy is used in a significant way – sometimes just a couple can be found, and other times they are all over the place!

Logic and Fallacy in Humour

Every time logic or a fallacy is used in humour it serves a specific role. I have found that a convenient way of classifying examples is in terms of three roles that seem to cover all the significant ways logic and fallacy are used in humour: 'essence', 'enhancer', and 'mechanism'. I will explain each of these as we go along and look at examples. Let's start with 'essence'.

Role 1: The logic or fallacy used serves as the *essence* of what makes it funny. In these cases other aspects might enhance the humour, but the logic or fallacy is precisely what makes it funny, such that without it there is no humour left.

'Equivocation' is the name of the most common informal fallacy used in humour and usually it is the essence of what is funny. Equivocation occurs when two different meanings or senses of the same word(s) are used as if equivalent. In humour equivocation is often played out with two people – where one person says something implying one meaning and the other person takes it as if another meaning was intended.

For example, in the Mel Brooks movie *Young Frankenstein* Dr Frankenstein arrives at his family's castle in Transylvania and, as he is lifting his assistant Inga out of their carriage, notices big elaborate knockers on the door. He exclaims: "What knockers!" Inga, thinking he is complementing her, replies "Oh, thank you Doctor" with an excited smile. Clearly, there is equivocation here with the word 'knockers', and it is the equivocation that is the essence of the joke. This becomes apparent when one considers what happens if you take it away. The only way to remove the equivocation would be to disambiguate between the two meanings, so I suppose Dr Frankenstein would have to say "What door knockers!" or "Look at the knockers on that door!", but then the joke would be completely ruined. Now although the essence is the equivocation, there are other aspects that enhance the humour, like Inga's flirtatious character.

Looking back at the first example, the Monty Python skit with the accountant and the chairman, you can see that this also has an equivocation. The chairman clearly means one thing when he says "isn't it possible there may have been some mistake?", but the accountant takes it to mean something very different. Wilkins' reply reveals that there is ambiguity in what the chairman has said. It is this two-person equivocation (which rests on the ambiguity) that is the essence of what is funny.

One thing in logic that is often used in humour and that usually serves the role of essence is known as 'contradiction' or 'absurdity'. This occurs when contradictory statements are given or implied, producing a nonsensical, absurd situation. In terms of formal logic, this is like having both 'A' and 'not A' (where A could be substituted with anything). In formal logic having both 'A' and 'not A' simultaneously is considered always false, or as some logicians say: absurd.

Here is an example from the Marx Brothers' movie *Duck Soup*, in which contradiction is the essence of what is funny:

Firefly: "Just for that you don't get the job I was going to give you."
Chicolini: "What job?"
Firefly: "Secretary of War."
Chicolini: "All right, I take it."
Firefly: "Sold!"

It is the contradiction, the presence of 'not A' (I'm *not* giving you the job) and 'A' (you have the job) that makes it funny. The speed of the exchange enhances the humour greatly – for the Marx Brothers, as well as many others, timing adds a lot to their work. But try to remove the contradiction from this piece and keep the joke – it's impossible. On the other hand, you can say it as slowly as you want, and surely it won't be as funny, but the joke will remain.

Here is another example, from *Monty Python's Flying Circus*, in which contradiction serves as the essence of the joke. An army officer stops a skit because it is getting too silly and says: "Nobody likes a good laugh more than I do. Except perhaps my wife. And some of her friends. Oh yes, and Captain Johnson. Come to

think of it, most people like a good laugh more than I do.”

This bit is funny because he goes from saying one thing to saying the opposite. This is a contradiction in formal logic; it is absurd to start with the premise 'A' and be left with the conclusion 'not A'.

There is an informal fallacy called 'False Cause' that is used in humour and that often has the role of essence. False Cause happens when it is assumed that simply because A has preceded B, that A has caused B. In the Steve Martin movie *All of Me*, a Swami has just arrived in America and has never seen a toilet or a phone before. He flushes the toilet to see what it does and the phone happens to ring immediately after. He flushes it again and, as the caller has not hung up, the phone rings again. From this the Swami concludes that flushing the toilet causes the phone to ring. The essence of the humour in this scene is the Swami's error in reasoning – he assumes that flushing causes ringing simply because the one happens to precede the other.

Role 2: The logic or fallacy used serves as an *enhancer*. In other words, the logic or fallacy adds to the essence of what is funny to make it even funnier.

'Hasty Generalizations' are a kind of informal fallacy that often enhance humour. A hasty generalization occurs when a generalization is made from too few cases or, as often seen in humour, when the generalization is obviously not true as a literal statement (a clear exaggeration). For example, in a stand-up comedy routine about the subways in New York, Bill Cosby says: "They go out of their way to entertain you. They put a nut in every car. You get on any subway car and some nut will stand up and say 'The Lord will kill you if you don't sit down here'."

The humour here is enhanced by the generalization Cosby is making; he takes what one might encounter on the subway and generalizes it to say that this is what you will find on *every* subway car. The statement would still be funny without the generalization, but the generalization certainly enhances it.

In his book *Without Feathers* Woody Allen writes "What if everything is an illusion and nothing exists? In that case, I definitely overpaid for my carpet." The essence of what is funny here seems to be that the question he states is a serious philosophical issue of perception, matter and reality; and, what he is worried about when he thinks of this is *his carpet!* He's got a serious philosophical question followed by a very trivial, non-philosophical reply. But enhancing this humour is the fact that the conclusion does not follow from the premise; in his argument he does not account for an obvious consequence of the premise 'nothing exists' – that money does not exist. He has inferred from his premise that his carpet does not exist (which is why he thinks he would have overpaid), and should infer that, just as he does not have a real carpet, he did not really pay for it. This is an example of the informal fallacy of Suppressed Evidence, which occurs when relevant information is left out of an argument. But more specifically this can be described as formally fallacious because in formal logic if you have a universal statement, which in this case is "everything is an illusion and does not exist", then every object in that domain (which here is anything material) takes on that property, with no exceptions. This fallacy may enhance the line for some readers, since the carpet comment is not only out of place but also nonsensical.

Now let's look at the third and final role that logic or fallacy plays in humour.

Role 3: The logic or fallacy used serves as the *mechanism* that *allows* the humour to occur – the logic or fallacy is what gets you from one thought to another. When *formal logic* takes on the role of mechanism, valid logic is used to get the reader or audience to make a certain inference from one idea to another. For example, in Monty Python's *Argument Clinic* the customer purchases a five-minute argument with Mr Barnard, but Mr Barnard *argues* that he has not paid him:

Mr Barnard: "I've told you, I'm not allowed to argue unless you've paid."
 Customer: "I just paid!"
 Mr Barnard: "No, you didn't."
 Customer: "Look, I don't want to argue about that!"
 Mr Barnard: "Well, you didn't pay!"
 Customer: "Aha! If I didn't pay, why are you arguing? I've got you!"
 Mr Barnard: "No, you haven't."
 Customer: "Yes I have. If you're arguing I must have paid!"
 Mr Barnard: "Not necessarily. I could be arguing in my spare time."

The mechanism through which we get the customer's point is one of formal logic – specifically, *Modus Ponens*. When he says "If you're arguing I must have paid!" those watching the skit have the *unstated* premise: "you're arguing" since Mr. Barnard is arguing, and then infer through *Modus Ponens* "therefore I must have paid!" This intuitive work is necessary for the line to make sense. You need the "If you're arguing I must have paid!" to come with an implicit understanding of what it entails. It is not that one consciously thinks of this but rather that one must be making an *unconscious* inference.

This use of *Modus Ponens* cannot be fully stated by the customer because that would be unnatural, awkward and certainly not funny. So what is happening here is a sort of unstated punch line. This seems to occur a lot in humour: the premise of a formal logic argument is stated so that an inference, which is necessary for getting to the punch line, is made intuitively. Notice how Mr Barnard's quick reply is a rejection of the premise "If you're arguing I must have paid", which is a perfectly legitimate way to attempt to refute an argument. So you may think the customer has 'got him' and then in a split second you see that he hasn't

quite.

It must be that the intuitive inference happens in that little space of time between one line and the next. A big part of effective humour is precise timing – leaving just enough time for the joke to register and no more. Similarly, in the case of intuitive inferential work, the time between lines has to be just the right amount for the logic to click. It seems that the amount of time it takes for the audience to get the joke *is* the amount of time it takes for the unconscious inference to happen.

Here is another example of when an argument in formal logic is used in humour where much of it is unstated. In Shakespeare's play *As You Like It*, Touchstone, a court jester, says to a shepherd: "Why, if thou never wast in court, thou never sawest good manners, then thy manners must be wicked; and wickedness is a sin, and sin is damnation. Thou art in a perilous state." The *essence* of what makes this funny is known as the Slippery Slope Fallacy – when it is assumed that something leads inevitably to certain consequences that in truth don't necessarily follow. Touchstone is sliding along the slippery slope, leaving him with the far-fetched conclusion that if you haven't been in the royal court then you are damned to hell. These lines are funny because of the irrational slippery slope fallacy, but the *mechanism* used here is a *valid argument* in formal logic. In this case the argument is quite a bit longer than the one in the last example – there are in fact four intuitive inferences that must occur. If they didn't occur, this argument would seem like a string of unconnected statements.

The last two examples were of formal logic, but there are also many cases in which formal fallacies are used as the mechanism. As in formal logic this means that the fallacy is used to get you from one thought to another; but, unlike the case of correct logic, fallacies have in them mistakes in reasoning, which at times are tricky to catch. In Lewis Carroll's *Alice in Wonderland* a pigeon says to Alice: "You're a serpent; and there's no use denying it. I suppose you'll be telling me next that you never tasted an egg!" Alice replies: "I have tasted eggs, certainly... but little girls eat eggs quite as much as serpents do, you know." From this the pigeon exclaims: "... if they do, why, then they're a kind of serpent." The pigeon is committing the formal fallacy known as *Affirming the Consequent*, which occurs when you have 'If A then B', you know 'B is true', and you falsely conclude from that 'A is true'. Specifically, the pigeon is reasoning like this:

Premise 1: If you're a serpent then you eat eggs (If A then B)
 Premise 2: Alice eats eggs (B is true)
 Conclusion: Therefore Alice is a serpent (therefore A is true).

Clearly this reasoning is fallacious – Premise 1 says that being a serpent guarantees that you eat eggs; it does *not* guarantee that all who eat eggs are serpents. This fallacy is what allows the pigeon to draw the conclusion that Alice is a serpent.

To those who do not catch it, the fallacy is acting as the mechanism and it is the absurdity of the conclusion that is the essence of what is funny. However, to those who find this fallacy obvious (perhaps not its name, but the concept of it) the fallacy may *also* serve as the essence of the humour since they may find the error in reasoning funny, knowing the pigeon is making a mistake and therefore getting the absurd conclusion. So, there is a difference between *subtle* and *obvious* fallacy use – subtle fallacies tend to serve humour mechanistically since they go unnoticed but allow absurdities to be reached, while obvious fallacies tend to serve humour as the essences or enhancers since the mistake is part of what is funny.

Human Capacity for Logic

This discussion of logic and logical fallacy in humour certainly does not end with finding examples and trends. Various questions concerning the relation between human thought and logic spring to mind. For instance, you might ask what conclusions, if any, we can draw about human intuitive logical capabilities from the presence of logic and logical fallacy in humour. Since logic can be an essential part of humour, sometimes requiring you to follow along and make intuitive inferences, this seems to imply that *some* logic is implicit in the way we think and that there are some logical forms we relate to and reason well with. On the other hand, the various ways in which logical fallacies are used in humour imply that when logical fallacies are made clearly we are good at catching the mistakes, but when they are made more subtly we are fairly subject to error – thinking that something is logical when really it is not or sensing that there is something wrong but not knowing quite what it is.

The nature of the relationship between human thought and logic has been debated by philosophers, and also by cognitive psychologists, for a long time. It seems to me that this discussion can be approached from all kinds of different angles, and the presence of logic in humour that many understand and enjoy is one very interesting approach to pursue. I'm not suggesting that philosophers, logicians, and psychologists get together on a big couch, with a bag of popcorn, and watch Monty Python or Mel Brooks – although, that might not be a bad idea.

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Julia Nefsky will begin graduate studies in philosophy at the University of California, Berkeley in August 2005. She has just completed a degree in philosophy and mathematics from McMaster University.

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