Tony Veale
University College Dublin and the Royal Flemish Academy (VLAC)

FIGURE-GROUND DUALITY IN HUMOUR: A MULTI-MODAL PERSPECTIVE

Abstract

Creativity with words or pictures is not simply a matter of communicating a message, but of communicating it *well*, in a way that is effective, original and which defies convention. Effectiveness here pertains to the pragmatic goals of the communicator, and the extent to which these are achieved, while originality pertains to the manner in which the message is framed. Language, for instance, provides a wealth of conventions for framing a message; indeed, the vast part of language is a solidified body of culturally received conventions, which fix the meaning of words and phrases and determine the contextual appropriateness of specific terms, topics and conversational strategies. To frame a message in a novel manner that stretches or even subverts these conventions, a communicator must imbue the elements of communication–whether words, gestures or pictorial elements–with additional meanings. This duality of meaning is not arbitrary, however, or communication cannot succeed. Rather, a creative communicator must draw out secondary meanings that are already implicit in the stock elements of communication, in a way that the audience can understand, appreciate and replicate. Duality thus lies at the heart of creative communication, allowing a communicator to say one thing and simultaneously convey another, secondary message that may augment or subvert the overt content of the communication. This mechanism, which draws out and gives prominence to that which is normally unseen or implicit, is *Figure-Ground Reversal*.

Keywords

Humour, images, creativity, figure-ground reversal, incongruity, GTVH.

1. Introduction

Figure-ground reversal (FGR) is a gestalt phenomenon most commonly associated with visual perception, and indeed, few readers will be unfamiliar with

trick images such as the Necker cube (see Fineman 1996) and others that exemplify this phenomenon (see also Figure 1). Such *tricks of the eye* are possible because the figure-ground distinction is so essential to the understanding of even the simplest of images, since any feature that an image presents must be understood relative to its larger visual context. Thus, even primitive markings on an otherwise blank page exploit a distinction between that which is foregrounded (the markings themselves) and that which lies in the background (the emptiness of the page). As an image is made more complex, the figure-ground distinction allows one to compress several layers of meaning into an integrated visual form. This is true not just for detailed photographic images, but for cartoons, comic strips, sketches, blueprints and even abstract paintings. An image that compresses multiple viewpoints can have mean distinct meanings for different viewers in different contexts, and so for purposes of description, indexing and retrieval, our descriptive notations must allow for the separation of the different levels of figure and ground that an image may contain.

But one can also paint pictures with words, and so the figure-ground distinction is not confined to the realm of images. Indeed, the distinction may generally apply to any aspect of cognitive structure where salience can be redistributed from primary to secondary features, that is, from those elements that are highlighted, marked or privileged to those that are not. As such, the figure-ground distinction, and the trickery that it supports via the reversal of figure and ground elements (henceforth denoted by its common abbreviation FGR) can play a significant explanatory role not just in theories of image comprehension, but in theories of scientific discovery, philosophical argumentation (e.g. thought experiments), analogy, metaphor and humour; in fact, it can aid our understanding of any cognitive phenomenon in which a conceptual structure is creatively reorganized to yield new insights and meanings. As such, we believe that creativity–whether with images or with language–crucially relies on an ability to separate layers of meaning that are not always obvious or notable on first inspection. Once identified, these layers can be manipulated so that meaning elements that were previously implicit become more prominent, while elements that were once considered central become more peripheral.

The often cathartic effect of this reorganization is perhaps most keenly experienced and appreciated in the realm of humorous creativity. In this paper, we explore the role of FGR both in images, where it is used to achieve creative concision and multiplicity of interpretation, and in language, where it less conspicuously but more dramatically exploited to achieve humorous ends. We argue that much of the dynamism, inventiveness and deconstructive playfulness of creative expression arises from a general cognitive ability to apply FGR at different levels of linguistic and conceptual description. With these goals in mind, the paper assumes the following structure: in section 2 we consider the role of FGR in the

domain with which it is most closely associated, that of images, to demonstrate that FGR is not limited to simple visual illusions. Rather, through a multi-modal consideration of images, cartoons, comic-strips, logos and maps, we argue that FGR is a cognitive tool that, when harnessed properly, is capable of subtly re-framing a situation to achieve a concise yet information-dense duality of form and meaning. In section 3 we then turn to a consideration of the role of FGR in verbal humour, both in terms of its place in existing theories of humour such as the GTVH, and in terms of the much broader remit we see for FGR in humour. We build on this analysis in section 4 to explore the deconstructive and re-organizational powers of FGR in language; our goal here is to demonstrate that FGR is a general-purpose mechanism whereby linguistic meanings can be disassembled and recombined at any level of detail, from the morphological to the semantic and the conceptual. We conclude with some final remarks in section 5.

2. Figure-ground duality in images

The figure-ground distinction is most widely appreciated in the context of visual illusions, such as the classic lady/crone, duck/rabbit and goblet/face images of Figure 1. These examples exploit the distinction between figure and ground to compress two alternate interpretations into the same pictorial representation. These interpretations are fused together, but cannot be perceived simultaneously; rather, the viewer must perform a *gestalt switch* to move from one to the other. Thus, depending on which part of the image one chooses to focus upon, an image will snap into one or the other of these gestalts. We discuss later how humour also exploits this sudden switch between interpretations.

Figure 1. Classic examples of figure-ground duality, or "gestalt-switching"
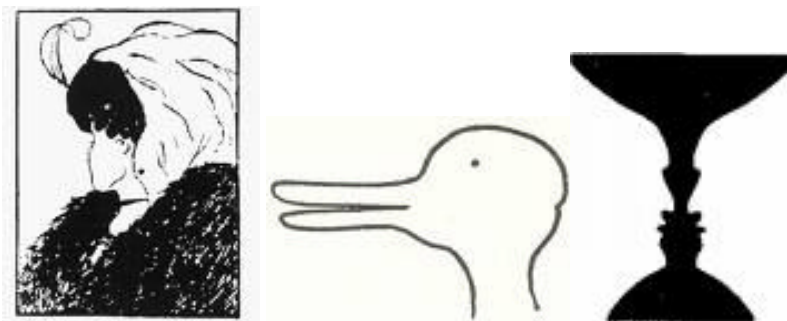
In the images of Figure 2, however, this duality is harder to perceive, for one must physically invert the images to uncover the alternate depiction that each contains. The images of Figure 2 are taken from a series of comic strips by the Dutch cartoonist Gustave Verbeek, as published in the New York Herald in 1904. These strips are remarkable for their mastery of visual duality, for each six-panel page, when rotated by 180 degrees, yields a continuation of the same narrative so that the strip as a whole actually comprises twelve distinct panels (see Verbeek 1963). In this example, we see (on the left) a panel depicting an old man in a canoe, struggling to catch a fish near a small island with two trees; when rotated 180 degrees, we obtain the image on the right, which depicts a mythic bird (a "Roc") with a young woman wedged between its beak.

Figure 2. The right image, panel 5, is a 180° rotation of the left image, panel 8
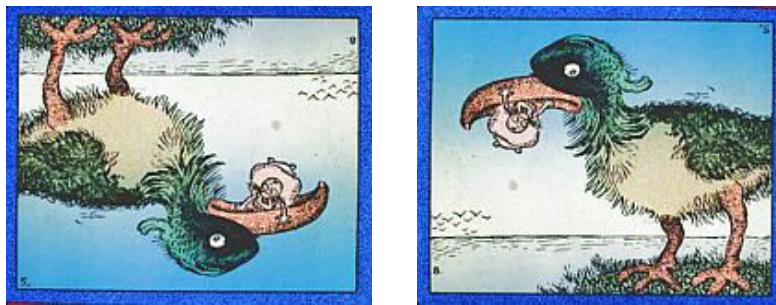
What is more remarkable is what we do *not* see in the right panel: we do not see a fish, a canoe, an island, two trees or an old man. Aided by the fact that these individual elements are harder to identify when viewed upside down, our minds instead construe the image differently, to reach a radically different interpretation.

Trickery and illusion are just one application of FGR. In many cases, the figure-ground distinction is used far more innocuously, to achieve a subtle economy of expression. Consider an extract from the modern comic strip "Mary Worth" in Figure 3. Given the broad newspaper readership of this comic strip, the artist chooses not to foreground the death of the character named "Aldo Kelrast," and instead foregrounds a scene immediately prior to this event ("Aldo's drive") and a scene after this event (a visit to the grave of "Kelrast").

In fact, it is remarkably difficult to unambiguously depict a character's death in wholly visual terms without resorting to grisly detail, and many scenes of this kind resort instead to some form of explicit caption. In this case, the strip successfully focuses on the character's demise as a key event in the story's narrative while

relegating the actual death itself to the conceptual background, or as McCloud (1994) terms it, to the "gutter" between panels.

Figure 3. A scene from "Mary Worth" relegates a key event to the background
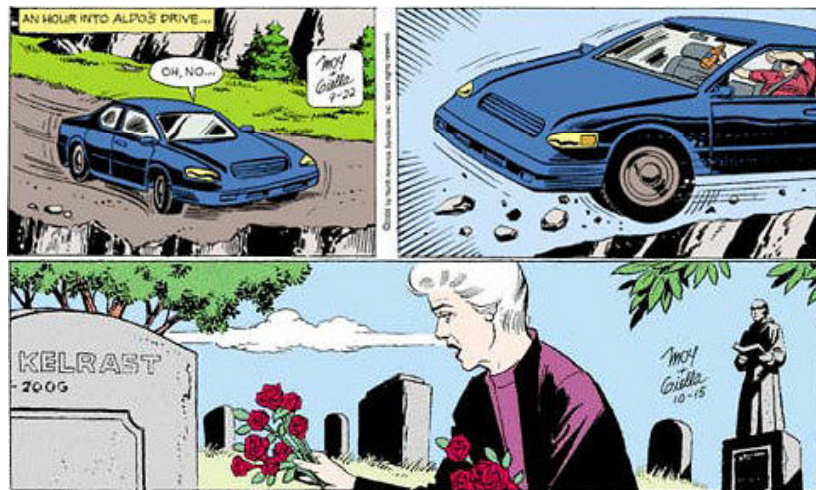
The strip of Figure 3 is the nearest one can get to a scene in "Mary Worth" in which "Aldo Kelrast dies," yet nowhere is this event either mentioned or depicted. Nonetheless, for retrieval purposes, this backgrounded event is the primary basis on which the strip of Figure 3 would be indexed and retrieved.

Figure-ground reversal plays a more obvious role in the comic strip of Figure 4, where once again the artist's goal is the subtle re-framing of a situation for artistic and communicative effect rather than overt trickery for its own sake.

Figure 4. FGR used as a framing device in Mark Trail, with ambiguous effects

In this two-panel strip from the series "Mark Trail," we perceive a shift of focus from one panel to the next: the foregrounded speakers in the left panel continue to speak in the right panel, but are moved into the visual background to allow another image, that of a squirrel, to take centre-stage. The squirrel plays no particular role in the plot, but is visually foregrounded simply to accentuate the nature theme of the strip. In fact, this animal is so foregrounded that it appears to be the source of the speech balloon, and only common-sense allows us to associate this utterance with the now backgrounded humans. In another example from "Mark Trail," the speakers in Figure 5 are sent so far into the visual background that they are no longer visible, and this allows for a creative duality in the way the speech balloon is constructed and interpreted. Once again, it appears as though a foregrounded animal, a duck, is the source of the utterance, but this time it seems quite apt that an animal would make such a condemnatory statement about mankind's cruel contempt for nature. In other words, the incongruity of a talking animal is here seen as appropriate, to yield what Oring (2003) calls an *appropriate incongruity*.

More generally, a figure-ground distinction allows an artist to compress two related scenes into a single depiction, by placing one in the visual background of another. In Figure 5, for instance, the left panel simultaneously presents a view from characters on the ground and characters in the air, in which the latter comment on the former from their vantage point in an airplane. Such framing devices are commonplace in newspaper comic strips, as they allow an artist to maximize the amount of action and story development that can be squeezed into a limited window of two or three panels. In this particular example, the artist chooses to foreground the most dynamic scene, that of a fight between hero and villain, while the much less exciting expository scene is backgrounded.

Figure 5. FGR is used to compress two viewpoints into one in the Mark Trail strip

We can see from these examples that FGR is a mechanism that can unpack multiple layers of meaning that have been compressed into a single form, whether visual or linguistic. While the trickery of Figures 1 and 2 achieves a playful effect,

FGR is not an inherently humorous phenomenon, and the comic strips of Figures 3 to 5 demonstrate an altogether more subdued effect. These examples use FGR as a tool in service of a larger communicative goal rather than an as impressive effect in its own right. Humour arises to the extent that there is tension between the dual layers of meaning that are compressed together, and to the extent that one layer of meaning appropriately subverts and undermines the other. For instance, this kind of tension leads to political humour in the multi-layered map of Figure 6, which depicts the fractious state of European affairs just prior to the Franco-Prussian war.

Figure 6. A comic map that operates at two levels of visual description

This comic map, by the French artist Paul Hadol, depicts the countries of Europe both as geographic forms and as national stereotypes. The background thus comprises a collection of humorous images that coalesce to yield a broadly accurate sketch of Europe's borders, but this foregrounded image can again be dissected to yield a historical commentary on the political relationship that holds between each adjacent country. Hadol provides the following caption to accompany his map, but his text merely summarizes what is already humorously evident in the details of his depiction:

> England enraged forgets Ireland but still keeps it in her power. Spain & Portugal smoke away lazily. France tries to overthrow Prussia who advances one hand on Holland & knee over Austria. Italy advises Bismark to keep off. Corsica & Sardinia laugh on at all. Denmark hopes to recover Holstein. Turkey is drowsily awaking from smoke. Sweden crouching like a panther. Russia a beggar trying for anything to fill his basket.

The humour, such as it is, arises from a contrast between each country's nuanced self-image with its simplified and anthropomorphized depiction in Hadol's map. Prussia, a military power of considerable might, is here depicted as a fat buffoon crouching on another country's neck, while Ireland, a troublesome colony of Britain, is depicted as a snarling lap-dog. In fact, the map is dense with insulting detail that rewards deeper analysis; for instance, though Prussia is depicted as a military power, the symbol of this military might–the characteristic picklehaube helmet–covers Prussia's eyes, to signify a form of political blindness or militaristic short-sightedness. The figure-ground distinction between global form and local detail is not itself the source of the map's humour, but a framing device that allows a humorous contrast–one that pits the grand affairs of state against the petty characteristics of individual–to be communicated.

The social dimension of Hadol's comic map serves to remind us that figure-ground duality is never humorous in itself, though some instances will exhibit greater potential for humorous exploitation than others. Any humour that arises must be assessed relative to the producer of the duality, the consumer of the product (the agent that actually performs the FGR), and the social and communicative goals of these agents. For instance, it is often the case that a producer is unaware of the duality inherent in a given product, and cannot thus lay claim to any creative intent. Such duality can produce humour when the unseen secondary meaning actively undermines the producer's intended primary meaning, making the producer look rather silly when this secondary meaning becomes apparent to others. In such situations, humour does not reside in the product itself, but in the *salience gap* that exists between producer and consumer (see Veale, Feyaerts and Brône 2006).

Figure 7. The logo on left (for the Office of Government Commerce) reveals the rather ruder image on the right when simply rotated 90 degrees clockwise

A case in point is the OGC logo in Figure 7; produced at a cost of 14,000 pounds (see Simpson 2008), this simple logo for the British *Office of Government Commerce* hides a rather crude sexual imagery that becomes strikingly apparent when the logo is rotated 90 degrees to the right. As in the Verbeek cartoon of Figure 2, the alternate conceptual perspective is only revealed by adopting an alternate physical perspective. But in contrast to the upside-downs of Verbeek, the transformation of Figure 7 exhibits an affective trajectory that is especially conducive to humour: the transformation of the OGC, a fiscally responsible agency, into a priapic figure-of-fun is at once a linguistically-motivated use of personification (we think of "agencies" as "agents," after all), a visual metonymy (the personification represents those who work for the OGC), and thus, a visual-coding of a verbal insult (to put it more crudely, OGC workers are depicted as "wankers" or "jerk-offs").

Like Hadol's map of Figure 6, the OGC logo is creative because of its duality of meaning, but it is humorous because this duality carries a pointedly insulting message beneath its primary form. Yet the creativity of Figure 7 is attributable mostly to the consumer, and so the insult it carries is all the more potent for being self-inflicted.

3. Verbal humour

Hadol's map also hinges on the use of personification to achieve a "human-scale" of description, allowing us to move from a "big-picture" view of Europe to the perspective of the "little person." This shift has a humorously reductive effect: each country, proud in its own right, is humbled and made pathetic by the personification. Like FGR itself, the notion of a "big picture" is clearly grounded in our appreciation of images, but this notion is also equally applicable to non-visual constructs such as verbal narratives. Generally speaking, we credit people who can perceive the "big picture" with a kind of insight that is lacking in those who "cannot see the woods for the trees." Humour often exploits the figure-ground distinction in joke narratives and witty dialogues to contrast these two kinds of people: an insightful interlocutor who sees the "big picture" (the background) versus a self-important or misguided fool who is overly fixated on local detail (the figure). Consider this exchange between the boxer Muhammad Ali and a female flight attendant. Though physically mismatched, she proves his verbal equal:

Flight attendant: Buckle your seat belt, Mr. Ali, we're about to take off.

Muhammad Ali: Superman don't need no seat belt!

Flight attendant: Superman don't need no airplane neither.

Here it is the stewardess that clearly perceives the big picture–the concept of traveling through the air–while Ali fixates on the local detail of seat-belts since it presents him with a short-lived opportunity for self aggrandizement. This exchange is an example of a humour-producing strategy that we have previously dubbed "trumping" (e.g. see Veale, Feyaerts and Brône 2006). Note how the stewardess does not actually disagree with Ali, but takes his assertion at face value and appears to accept it as true (as signaled by the dialectical "neither"). Rather than disagree with Ali's comparison, she simply points out a very obvious element of the Superman mythos that becomes even more salient in the context of air-travel (Superman can fly through the air, and is often mistaken for an airplane himself). This obvious fact, though plainly relevant, remains hidden from Ali's cognitive gaze because of his focus on that aspect of the Superman concept that yields the most flattering comparison (namely, his strength and resilience in the face of danger). Such rebukes effectively undermine or trump a speaker by showing that they are unable to recognize the most important and obvious elements of an argument, and as such, are unable to comment persuasively upon the big picture.

3.1. Figure-ground duality in theories of verbal humour

As typically conceived, a narrative joke is compatible with two different scripts or frames: one such frame or script is dominant, but yields an incongruity if used to interpret the entire joke; the other is less favoured, but is capable of capturing the logic of the whole joke. When the incongruity is encountered in the final stage of the joke–the punch line–the listener must switch from the favoured but unsuitable script to the unfavored but ultimately successful alternative (see Raskin 1985). Like a Verbeek cartoon strip, the text of a narrative joke yields two different stories at once. But unlike a Verbeek, one does not need to physically modify the text; rather, a perceived incongruity in the punch line prompts us to reinterpret what has gone before to achieve a very different conclusion. Nonetheless, creative duality is central to both, and the end effect is much the same. In each case, the elements of an alternative story line are hiding in plain sight, waiting for the opportunity to be re-framed by a viewer/reader willing to make the necessary figure-ground reversal.

3.2. Appropriate but incongruous duality

Many researchers have noted the apparently central role of incongruity in humorous creativity, from Suls (1972) to Raskin (1985) to Attardo and Raskin (1991) to Ritchie (1999) to Attardo et al. (2002) and Oring (2003), while Veale

(2004) has argued that incongruity is not so much a triggering condition in humour but a desirable after-effect that is only achieved with the collaboration of the audience. However we choose to construe the notion the incongruity, it seems plain that incongruity alone does not automatically produce either creativity or humour. Many incongruities are just unusual, peculiar or just irredeemably absurd. Oring (2002) augments the incongruity view by stipulating that incongruities can lead to humour only when they are appropriate, which is to say, when they are striking yet motivated by, and understandable within, the context of their use. Since we argue that the figure-ground distinction is used to compress incongruous meanings into a single dual-function representation, it follows that FGR must also be motivated and appropriate if it is not to be seen as merely absurd, but appreciated as potentially creative and humorous. The Verbeek and Hadol examples both demonstrate this appropriateness in different ways. For Verbeek, the visual field must be reorganized so that the narrative can be continued and satisfactorily concluded, though one detects a strong element of duality for its own sake in his work. In Hadol's map, the FGR is appropriate since it allows us to see how the national characteristics of a people might arise out of the geographic characteristics of a country (e.g. there is a sense in which Prussia is somehow *pre-destined* to act aggressively toward its neighbours since, appropriately, it has the geographic shape of a big fat bully). Linguistic uses of FGR must be just as appropriate and motivated if they are to yield creative effects in verbal humour.

Consider that the four most primitive and fundamental drives guiding the instinctive behaviour of mammals are commonly known as the *four F's*, namely *Fight*, *Flight*, *Feeding* and *Mating*. An incongruity arises in this phrasing because there are only 3 F-words in evidence here, and this incongruity is further reinforced by the fact that the exception, *Mating*, occurs at the end of the list after the F-pattern has been established in the preceding three examples. But the incongruity is well motivated, since the fourth word is clearly a euphemism for a four-letter F-word that conveys the same meaning in much more vulgar and socially unacceptable terms (in fact, this expletive is coyly referred to as "*the* f-word" in polite circles). We thus see past the foregrounded *Mating* to grasp the backgrounded F-word that lies underneath, and in doing so, preserve the validity of the phrase *four F's*.

Indeed, it is our desire to make this phrase meaningful that prompts us to resolve the apparent incongruity, by seeking a dual interpretation for the word *Mating*. Of course, there are more acceptable F-words that would convey the same meaning, such as *Fornication*, but without this humorous duality. Since there is no social injunction against using this particular F-word in polite company, a major motivation for the incongruity would be removed and the unusual phrasing would seem less inappropriate. The humour here thus relies on the complicity of the audience, both in their understanding of the speaker's desire to avoid any mention

of a vulgar word and in their desire to enjoy the frisson generated by this four-letter Anglo-Saxon expletive. As a result, the phrasing seems clever and cheeky, making the speaker (and the audience) simultaneously innocent *and* guilty of violating a commonplace taboo.

3.3. FGR in the General Theory of Verbal Humour

The phenomenon of FGR plays a very specific and localized role–*too* localized, we would argue–in the General Theory of Verbal Humour (GTVH) of Attardo and Raskin (see Attardo and Raskin 1991; Attardo, Hempelmann and Di Maio 2002), the formal theory of humour which currently dominates research in this field. As outlined above, the GTVH essentially offers a script-based incongruity-resolution view of verbal humour, in which a narrative may be compatible with multiple scripts, one of which may be more contextually primed than others. Like its progenitor, Raskin's (1985) Semantic Script Theory of Humour (or SSTH), the GTVH suggests that humour occurs when a listener is deceived into applying a highly primed script that ultimately leads to an *incongruity* (e.g. see Ritchie 1999; Veale 2004), an impasse of interpretation that can only be resolved by switching to an apparently less salient script. The GTVH views humorous resolution, whether partial or complete, as the work of a particular logical mechanism (LM) that applies at the level of scripts. Understandably, LMs have proved to be the most enigmatic elements of the GTVH, prompting Attardo et al. (2002) to enumerate a taxonomy of 27 different LMs.

For the most part, the GTVH notion of script is grounded in the work of Schank and Abelson (1977), who view scripts as schematic structures that impose a sequential, causal ordering on a narrative and which reflect a single top-down interpretation of events based on an abstracted distillation of relevant episodic memories. GTVH scripts can be activated in one of three ways: lexically (by association with a single word, called the *lexical handle* of the script); sententially (by a pattern of words and lexical scripts); and inferentially, as a by-product of common-sense reasoning (e.g. as one intuits that a joke is racist and activates a Racism script). Furthermore, since certain elements in a script will be more salient and foregrounded than others, these elements are marked to distinguish them from less salient background elements. More recently, Attardo et al. (2002) augment this view with a graph-theoretic account of script representation that views scripts as arbitrarily complex symbolic structures, to which mathematical processes like sub-graph isomorphism can be applied. This representational shift allows the GTVH to encompass even punning as a script-level operation, provided the notion of script is sufficiently generalized to accommodate phonetic as well as semantic information. This generalization, though it increases the descriptive

power of scripts, may be purchased at a heavy cost, that of the explanatory power of the GTVH as a theory.

Coulson's (2000) frame-shifting perspective offers a somewhat similar alternative to the script-switching account of GTVH by situating the process of humour production within the Cognitive-Linguistic framework of Conceptual Integration Networks (or *blending* theory) of Fauconnier and Turner (1998). Coulson's perspective is arguably the more flexible but least developed of the two approaches, since the Cognitive Linguistic notion of frame is more flexible than that of the GTVH notion of script, and so can more easily gain access to the various crevices of language where verbal humour can take root. Indeed, because Cognitive Linguistics advocates a non-modular approach to language, one that does not seek to impose barriers or arbitrary divisions between aspects of linguistic processing such as syntax, semantics, morphology and phonology, the blending framework can freely describe compositional structure at any level of linguistic description. Nonetheless, this descriptive generality gives rise to the suspicion that blending theory is little more than a convenient terminology, one in which any non-atomic entity at all can be considered a blend. One can draw sharp contrasts then between the non-modular over-generality of blending theory and the highly modular over-specificity of the GTVH, suggesting that an optimal perspective lies somewhere between these two extremes. Nonetheless, because the GTVH commits itself to specific details, it offers the most falsifiable (and therefore scientific) account of humour, and is thus the one we consider here.

In the SSTH of Raskin, the incongruities that trigger script switching are purely semantic, based on a fixed catalogue of antonymies like DEATH/LIFE. In contrast, the GTVH offers the possibility that incongruities may arise from a more nuanced spectrum of conceptual and pragmatic concerns. In a further evolution of the SSTH, the GTVH additionally sees humour production as the culmination of a modular process involving a variety of complementary knowledge resources, each determining a different element of a joke, such as narrative structure, logical mechanism, word choice, and so on. As noted earlier, the logical mechanism is the most crucial, and by far the most controversial, modular element of the GTVH. For instance, it is suggested that an LM called *false-analogy* is central to jokes whose humour derives from ill-judged comparisons, as in the old joke where a mad scientist builds a rocket to the sun but plans to embark at night to avoid being cremated. Here a false analogy is created between the sun and a light-bulb, suggesting that when the sun is not shining it is not "turned on," and hence, not hot.

The GTVH similarly views figure-ground reversal as a specific logical mechanism or LM that constructs a scenario in which two scripts offer inverted interpretations of the same narrative event. For instance, in the joke "How many X's does it take to change a light bulb? 100–one to hold the bulb and ninety-nine to spin the room around," the primed script ("twist the light-bulb") and the unprimed

script ("twist the room") make complementary identifications of figure and ground. A switch from the first script to the second thus results in a figure-ground reversal. FGR is here seen by the GTVH as a specific logical mechanism that is literally realized within the world of the joke: the X's in the above actually perform a physical FGR by twisting the room (the ground) rather than the light-bulb (the figure). Attardo et al. (2002) enumerate six different reversal-based LMs (of 27 in total), such as chiasmus, role exchange and vacuous reversal. However, one cannot help but feel that the designation of FGR as a particular logical mechanism, and reversal in general as a family of LMs, understates the importance of FGR in humour, reducing the phenomenon to a conceit that can be found in any number of related jokes that each instantiate the same template or *Ur-joke* (see Hofstadter and Gabora 1989). This is particularly jarring if, as we argue, FGR can operate at many different levels of conceptual description, thereby possessing a granularity of application that transcends the level of a simple conceit or formulaic Ur-skeleton.

4. FGR as a mechanism of linguistic reorganization

Indeed, it seems almost paradoxical to assume that a theory of verbal humour can be constructed on a relatively static substrate of script structures, no matter how baroque the taxonomy of combination mechanisms. Creative humour is surely resistant to analysis by scripts if, by definition, truly novel events cannot be anticipated. Certainly, one needs more flexible notion of script than the top-down formulation offered by Schank and Abelson, since it is highly unlikely that one would already possess a script for turning a room to screw in a bulb. In the *four Fs* joke discussed earlier, there is no *a priori* script that is invoked, just an ad-hoc expectation that is established within the joke itself: the joke promises four Fs, which we construe as four words beginning with the letter "F," but only provides three. In many jokes, there is not so much a switch between two different scripts but a switch between a formulaic expectation and a creative instantiation of this expectation. The latter, as a novel construct, cannot be said to exist in advance, and the GTVH offers no mechanism for its construction, even though the elements of GTVH scripts contain the necessary salience-level markings. Nonetheless, figure-ground reversal can be construed as such a mechanism, though one that transcends discrete categorization as an LM. Consider the following witticism from serial divorcee Zsa Zsa Gabor:

> "Darling, actually I am an excellent housekeeper.
>   Whenever I leave a man, I keep the house!"

The GTVH entreats us to view this joke as a juxtaposition of scripts, but where do these scripts originate? One might well expect to find a housekeeping script in the lexicon, indexed by its lexical handle "housekeeper," but where does the juxtaposed meaning "a taker and keeper of houses" reside? The most obvious answer is that it is constructed dynamically by the hearer, using FGR to deconstruct the conventional meaning "housekeeper" into "a keeper of houses" and to dynamically construct a new meaning that foregrounds the conventional meaning of the verb *to keep* (i.e. to maintain control over, and maintain ownership of, some possession). Though one can represent this re-conceptualized meaning as a graph structure, it is hardly a script of the GTVH mould. Furthermore, since the comparison of scripts can only follow the dynamic creation of the new "script," the re-conceptualized meaning cannot be constructed by an LM, even if that LM is GTVH's concept of figure-ground reversal.

Linguistic humour stretches the notion of a dynamic script even further, in its deconstructive ability to manipulate even the sub-structure of words. Consider humorous word formations like "manunkind," "copyleft" and "McJob," which would require the GTVH to posit some form of "morphology script" before it could gain any sort of explanatory traction. In contrast, FGR readily explains these morphological jokes, since a complex word is a salient figure that is constructed from a backdrop of smaller lexical units. How often do we use complex words like "seminar," "disseminate" and "seminal" without attaching any prominence to the backgrounded words that give rise to them? Whenever a speaker decomposes a complex word into its component units, a figure-ground reversal must take place, since decomposition gives greater salience to the parts than to the whole. Once alteration of a particular component is performed, as in "right" to "left" to highlight a more liberal attitude to copying, or "kind" to "unkind" to highlight the essential cruelty of humanity, another FGR is required to recombine these parts and return the modified whole to the foreground. In the blending vocabulary of Fauconnier and Turner (1998), FGR here performs an "unpacking" of a complex word-blend to reconstruct the input spaces that originally gave rise to it.

This reorganizational ability of FGR can, more generally, be used to invert the definitional basis of derived concepts, which are those that depend on a logically prior concept (or set of concepts) for their existence. Consider, for the instance, the one-liner:

"If God wanted us to be vegetarians he wouldn't have made animals out of meat."

As an animal product, Meat is a derived concept whose existence requires the existence of animals, or, in language of cognitive grammar (see Langacker 1987), Meat is a profiled figure element of the base concept Animal. The effect of FGR on the definition of a derived concept like Meat is to make the profiled figure appear

logically independent from its base concept. Freed from this yoke, an agent can explore a notion of meat that is not derived from animals, to perhaps arrive at a new conceptualization of an idea previously taken for granted. Additionally, the joke suggests a new definition of Vegetarian as simply a person whose diet is not derived from animals but who may eat meat from other sources. In effect, the use of FGR introduces an intellectual wiggle-room between concepts that were previously so tightly-coupled as to be logically inseparable.

One might argue that the above joke is humorous only because it employs a line of faulty reasoning (e.g. as might be argued by Minsky (1980), or by Attardo and Raskin via the logical mechanism of false analogy), though we would pointedly disagree with such a diagnosis. Nonetheless, the point is moot because one can invert the definition of a derived concept without doing violence to its underlying logic, as in the following satirical remark by the writer Will Self:

> "Eating is over-rated. Food is just shit waiting to happen."

By playing with tense, the author succeeds in redefining Food in terms of Excrement without affecting the underlying causal order (i.e. that excrement is derived from food). The FGR strategy employed here is the causal equivalent of topicalization, allowing the satirist to move an oblique concept from the causal background into a foreground position. The time-shifting effect, a form of metonymic *tightening* or compression (e.g. see Fauconnier and Turner 1998; Veale and O'Donoghue 2000), strengthens the connection between Food and Excrement to uncomfortably suggest that when one is eating the former, one is simultaneously eating the latter. This tightening is the opposite effect to that created by the Animal/Meat reversal, whose outcome is instead a form of metonymic *loosening*.

5. Concluding remarks

Samuel Johnson once remarked that a critic or scholar who builds his argument upon highly selective examples is like the man "who, when he offered his house to sale, carried a brick in his pocket as a specimen." In other words, one must look past local detail, no matter how salient and attention-grabbing, to perceive the bigger picture if true understanding is to be achieved. Of course, there is a certain irony in quoting Johnson in this respect, but it is nonetheless hoped that the examples presented here constitute more than a single brick in the theoretical humour framework we are attempting to construct.

Theories such as the GTVH seem to liken the operation of humour to that of a kitchen appliance, in which logical mechanisms are little more than the optional whisks and cutting blades that can be attached in different contexts to meet

different production needs. We find it more compelling to believe that figure-ground reversal, rather than serving a detachable role in humour, is instead an intrinsic part of the appliance, perhaps even the motor that drives the rotation of all other components. This switch, in which we see FGR as more that just another logical mechanism, but *the* primary means of creative production (and, thus, of verbal humour), is itself a figure-ground reversal of sorts. There is more to this switch than verbal sleight of hand, since it allows us to bring psychological insights and computational constraints concerning each phenomenon to bear on our understanding of the others (see Veale 2006). Indeed, by relating the key mechanisms in humour to the key mechanisms in visual illusion and creative discovery, we can identify the common emotional states that underpin each, the qualities that give rise to these states, and the factors that produce these qualities. Since each phenomenon involves a cathartic response that combines elements of relief, surprise, satisfaction and joy, we can begin to relate the "Ha" response of humour to the "Aha" response of scientific discovery to the "wow" response of visual illusion.

We thus find it far more credible to claim that FGR plays an intrinsic role in creativity itself, whether it involves images, words or ideas. In this vein, we have argued that FGR is a general-purpose multi-modal tool for performing creative reorganization, one that can take apart, re-assemble and re-package complex objects at almost any level of formal description. When applied directly to the level of concepts, FGR allows us to generate novel perspectives that are both thought-provoking and insightful, changing the way we think about the world and throwing previously tacit connections between concepts into sharp relief. Since humour is one of our most common outlets for creative behavior, theories of humour that do not also strive to be theories of creativity will be inherently limited in their ability to talk about either. But humour can inform creativity research just as much as creativity can inform our understanding of humour, for in contrast to the low-key creativity of the comic-strips in Figures 3, 4, and 5, humour involves the kind of creativity that inevitably draws attention to itself, to cry out "laugh at me, I am clever and surprising and funny." As such, humour offers a window into the workings of creativity in which the effects of mechanisms like FGR can be more readily observed, not just in terms of their effects on a conceptual representation, but in terms of their very evident effects on an audience.

References

Attardo, Salvatore and Victor Raskin. "Script theory revis(it)ed: Joke similarity and joke representational model." *Humor* 4.3 (1991): 293-347.

Attardo, Salvatore, Christian F. Hempelmann and Sara Di Maio. "Script oppositions and logical mechanisms: Modeling incongruities and their resolutions." *Humor* 15.1 (2002): 3-46, doi: 10.1515/humr.2002.004.

Coulson, Seana. *Semantic Leaps: Frame-shifting and Conceptual Blending in Meaning Construction*. New York/Cambridge: Cambridge University Press, 2000.

Fauconnier, Gilles and Mark Turner. "Conceptual integration networks." *Cognitive Science* 22.2 (1998): 133-187, doi: 10.1207/s15516709cog2202_1.

Fineman, Mark. *The Nature of Visual Illusion*. New York: Dover, 1996.

Hofstadter, Douglas R. and Liane Gabora. "Synopsis of the Workshop on Humor and Cognition." *Humor* 2.4 (1989): 417-440.

Langacker, Ronald W. *Foundations of Cognitive Grammar: Theoretical Prerequisite*s. Stanford: Stanford University Press, 1987.

McCloud, Scott. *Understanding Comics: The Invisible Art*. New York: Harper Perennial, 1994.

Minsky, Marvin. "Jokes and the logic of the cognitive unconscious." *A.I. Memo No. 603*, M.I.T. A.I. Laboratory, 1980.

Oring, Elliott. *Engaging Humor*. Chicago, IL: University of Illinois Press, 2003.

Raskin, Victor. *Semantic Mechanisms of Humor*. Dordrecht: D. Reidel, 1985.

Ritchie, Graeme. "Developing the Incongruity-Resolution Theory." *The Proceedings of the AISB Symposium on Creative Language: Stories and Humour*, Edinburgh, Scotland, 1999.

Schank, Roger C. and Robert P. Abelson. *Scripts, Plans, Goals and Understanding*. New York: Wiley, 1977.

Simpson, Aislinn. "OGC reveals new logo to red faces." *Daily Telegraph*, April 29, 2008.

Suls, Jerry M. "A two-stage model for the appreciation of jokes and cartoons: An information-processing analysis." In *The Psychology of Humor*, edited by Jeffrey H. Goldstein and Paul E. McGhee, 81-100. New York: Academic, 1972.

Veale, Tony. "Incongruity in humor: Root-cause or epiphenomenon?" *Humor* 17.4 (2004): 419-428, doi: 10.1515/humr.2004.17.4.419.

—. "Computability as a test on linguistic theories." In *Cognitive Linguistics: Current Applications and Future Perspectives*, *Applications of Cognitive Linguistics*, edited by Gitte Kristiansen, Michel Achard, René Dirven and Francisco Ruiz de Mendoza Ibáñez, 461-481. The Hague: Mouton de Gruyter, 2006.

—. and Diarmuid O'Donoghue. "Computation and blending." *Cognitive Linguistics* 11.3-4 (2000): 253-282, doi: 10.1515/cogl.2001.016.

—., Kurt Feyaerts and Geert Brône. "The cognitive mechanisms of adversarial humor." *Humor* 19.3 (2006): 305-338, doi: 10.1515/HUMOR.2006.016.

Verbeek, Gustave. *The Incredible Upside-Downs of Gustave Verbeek*. Summit, NJ: Rajah Press, 1963.

About the author
Tony Veale is a computer-scientist and computational linguist who works in the School of Computer Science and Informatics at University College Dublin. He is currently a visiting fellow at the Royal Flemish Academy for Arts and Science (VLAC) in Brussels. His research group explores the computational understanding and processing of creative language, humour, metaphor, analogy and conceptual blending. Related papers and on-line demonstrations can be found at his group's web-site afflatus.ucd.ie.