2011

The Mechanics of Caricature and Their Application in the Classroom Through Software

Stuart Medley
Edith Cowan University

Hanadi Haddad
Edith Cowan University

The Mechanics of Caricature and Their Application in the Classroom Through Software

Stuart Medley, PhD
Design, School of Communication and Arts
Edith Cowan University, Australia
s.medley@ecu.edu.au

Hanadi Haddad, PhD
Design, School of Communication and Arts
Edith Cowan University, Australia
h.haddad@ecu.edu.au

Abstract: The human visual system (eyes and brain) has the capacity to understand pictures where detail has been removed. The visual system also has the capacity to understand images that are exaggerated in particular ways. The authors coordinate a university graphic design class centered around vector illustration in which the communicative potential of caricature is explored. The researchers approach to teaching vector illustration is unique in that it departs from the usual crisp, clinical and often geometric aesthetic associated with vector graphics. Instead the authors use the potential enabled in illustration software, specifically layers and object oriented graphics, as a means to explain to students the theory and technique behind caricature. Students are presented with a brief to create editorial illustrations and asked to rationalise their visual decisions. This approach allows students to bring together theory and practice while gaining persuasive skills for future commercial work.

Introduction

Typography as a defining term has become interchangeable with 'graphic design', and while font choice and application is seen as of paramount importance, image choice, virtually half of the communication design equation, is neglected in the theory and in practice is left to the instinct of the designer. Our research seeks to understand images to the extent that type is understood and evaluated in the field of graphic design. The research, touched upon in this paper, is used as a means of explaining pictures to students at Edith Cowan University (ECU). Part of the teaching of designed imagery at ECU includes an exploration of caricature based on the assumption that caricature is fundamentally a mental process that everyone conducts for the recognition of specific people or things. This paper will firstly outline the context for the teaching of carcicature in our university. Secondly, we explain some psychological theory behind caricature. Lastly we explain the way that illustration software is employed to help students make caricature drawings of their chosen subjects through a methodical process.

The Context of Teaching Caricature

At ECU, caricature-making exists in a Graphic Design Unit called DES2104 Vector Illustration. This is a class mostly populated by second year graphic design students, but open as an elective to any student enrolled in our School of Communications and Arts. In our approach to teaching image-making to students within this unit, we are very conscious of the realism continuum, a model used by various theorists (Dwyer, 1972; Gropper, 1963; Knowlton, 1966; McCloud, 1993) to evaluate the communicative effect of iteratively reduced realism in pictures. We are particularly interested in a simple question which is posed to the students at the commencement of the unit: why draw? In the age of the digital camera and all its conveniences students are prompted to think carefully about the many advantages of drawing pictures rather than *taking* pictures. For some tasks within the class students work on projects that suit the typical, crisp, clean aesthetic afforded by vector illustration software. These projects focus on the creation of pictograms for wayfinding systems and diagrams for visual explanations. The project under discussion here, however, utilises an atypical application of vector illustration

software for the creation of an editorial illustration. This project sees the students getting to grips with seemingly more expressive image making than is generally found through the creation of information graphics, while also improving their technical skills in an industry standard computer application. It is the combination of the technical parameters of the software and the theory behind drawing caricature that makes this project remarkable.

The Theory: Caricature, Evolutionary Psychology, and the Visual System

We have mentioned that we are interested in drawing as a means of image-making. Part of our research has been to question how it is that the human visual system can see and understand images that are 'less-real-than-real'. In other words, if the human organism has evolved by gazing upon the real world in all its detail, what are the mechanisms of the eye and brain that allow people to understand simplified or distilled pictures where detail has been removed? From the literature it seems that this facility is not simply a matter of acculturation. We do not just learn to see the simplified image. For example, human infants shown two dots and a line which have been placed into a face-like arrangement will spend more time looking at such an image than they will at a non-face arrangement of the same graphic components. This suggests that the face-like arrangement is perceived as having some relationship to a real face (Fantz, 1961; Morton & Johnson, 1991).

Furthermore, understanding visual stimuli is a complex contest between what the eye senses and what the brain understands. An object may be seen at an infinite number of angles, at a range of distances and in a gamut of different lighting conditions. Each of these situations will provide a potentially novel experience to the retina in terms of shape, size and colour. However, the brain has the ability to override these purely visual sensations in order that the assumption of novelty may be disregarded and the right conclusion be reached about the object being viewed. In other words, seeing is a complex, problem solving exercise rather than something to be taken for granted. These faculties have been labelled by psychologists as 'constancies' (Walsh & Kulikowski 1998, p.492). Shape, size and colour constancy are names given to some of these. In our teaching, we take the presence of these mental faculties as a reason for making distilled pictures that appeal directly to these faculties. This is graphic design as a means of solving the problems of seeing on behalf of the viewing audience.

One of the stranger faculties of the visual system—that also reflects upon our ability to see pictures that are other than photographically realistic—is the ability to recognise people from a picture not simply reduced in detail, but a picture whose important details have been exaggerated. This kind of image, best known as the province of the political cartoonist, is the caricature. Brennan defines caricature as:

> a graphical coding of facial features that seeks paradoxically to be more like a face than the face itself. It […] amplifies perceptually significant information while reducing less relevant details. The resulting distortion satisfies the beholder's mental model of what is unique about a particular face (Brennan, 1985, p.170)

To recognise an object, for example to distinguish a chair from a table, we must be able to map a potentially infinite set of images onto a single object representation, that is, we must solve what psychologists know as the object constancy problem. However, to delineate one type of chair from another, or more importantly, to delineate one face from another is a different problem for the visual system. Psychologist and face recognition expert, Gillian Rhodes explains:

> in order to recognise faces and other objects that share a configuration (birds, dogs, cars, etc., our visual system must find a way of representing the subtle differences that distinguish such similar objects, i.e. it must solve the homogeneity problem. […] We know that the visual system has solved these two problems [object-constancy and homogeneity]. After all, we routinely recognise familiar objects from different viewpoints and homogenous objects such as faces. What is less clear is how we solve these problems. (1996, pp.2-3)

Through a study of caricature and its paradoxical ability to render a person more recognizable than the person themself, Rhodes explains how the visual system in concert with cognitive apparatus allows the brain to map new visual input against stored 'norms'. These norms exist for whole ranges of visual information and are expanded upon with further experience of the visual world. Where the new visual information differs from the norm, the mind appears to store these differences in a form exaggerated beyond their actual appearance. For

example, if a person appears different from the norm because their eyes are closer together than is normal ('normal' being defined by the different visual experience of each viewer) the brain will exaggerate this difference further still by pushing the eyes closer together in the stored memory of that person.

In addition to this mental exaggeration of 'trends away from the norm', Rhodes explains as a somewhat more radical concept, that the visual system and the 'psychological landscape' to which it is linked, is actually predisposed towards and on the look-out for extreme visual signals; visual stimuli that are outside of the norm: "Extreme signals [those that do not usually occur in the natural world] are more noticeable, more discernible, and/or more memorable than less distinctive ones"(1996, p.9). She argues that:

> Stimuli that exaggerate some critical property of the natural stimulus, such as its size, contrast or number, often produce an enhanced response [...] This preference for extremes seems to be a fundamental feature of recognition systems, and one that imposes important constraints on the design of signals. (p.10)

Here Rhodes means 'design' in the sense of natural selection but the same might hold true for the human activity of design: exaggerated signals (those that do not naturally occur and are therefore not easily reproducible through photography) actually might communicate more immediately to a visual system predisposed to look for them. This is the possibility that spurs us on in our teaching and research. According to Rhodes, the ability of the human mind, in some cases, to interpret and understand exaggerated drawings better than photography "raises an even more intriguing possibility. If drawings can be interpreted as externalisations of mental representations, then […] those representations might themselves be caricatured. If so, then caricatures would be effective because they match the memory representations better than undistorted images!"

Some caricature theorists go further to suggest that specialist visual expertise can extend to recognition of any objects that may be discriminated by difference from a norm: That, in theory, any object may be caricatured. The criterion seems to be that such a group of objects has a norm, real or imagined. To each of us these norms will be different. For those of us that work in specialist areas it might be easier than for others to conceive of a norm for, say, nuts and bolts, dresses, cars, typefaces or even landscapes. At Figure 1 is an example where the setting and the vehicle are caricatured: where these differ from a 'normal' urban landscape (walls less straight than the typical rectilinearity of the illustrator's usual surroundings) and a 'normal' car (the wheels of a Fiat 500 *are* smaller than average): these aspects have been exaggerated by the illustrator.

Figure 1: Olivier Kugler, *Palermo* detail. Any object may be caricatured if the artist can conceive of a norm for such an object. The differences between the object and its norm are then exaggerated away from the norm.

Our students are encouraged to consider these theories of graphic distillation, iterative reduction and in this particular case exaggerative reduction, during the conceptual development process as part of the reasoning, and justification behind their project. Understanding the technique of caricature, both theory and method contributes to the student's skill set for possible future application of graphic design solutions. Having to articulate their thinking on each project, as it pertains to the theory will, in future, strengthen their rationalization to clients. The project brief prompts the student into considering the intended message to be

delivered by this editorial illustration to the viewer, and which of the image's details should be exaggerated (caricaturized) in order to highlight or evoke this intended message.

Why Illustration Software?

For the uninitiated in the ways of caricature-making, illustration software offers several important advantages over paper and pencil. The first advantage comes in the creation of a norm for the subject. Vector illustration software uses virtual objects: each separately drawn line and each point and spline along these lines can be individually moved. Secondly, such objects can be resized without loss of quality. Placing of raster images such as digital photographs or scanned photographic prints into the page is also easy to achieve. This is helpful in that students can work to a photographic reference of their subject. Furthermore, they can work directly over the photograph in a new layer. What computer drawing with the mouse lacks in comparison to paper and pencil—the ease of making quick yet controlled marks on the page—can be relatively easily regained if the students have access to a stylus and drawing tablet. In any case, as the instructions below will demonstrate, it is the freedom to move lines around on the screen and to work across several layers that makes the software a good choice for making caricatures.

The Instructions for Making Caricatures

In short, caricature can be described as a mechanical process that occurs in all minds, not just in that of the caricaturist. It is a process of comparing the appearance of a unique subject against a typical subject or 'norm' and then exaggerating the differences so discovered. Accordingly, we have formulated some basic instruction for the development of caricatures. These instructions (below and visualised through Figure 2) are intended deliberately to bring out the mechanical aspects of the process.

1. Find a suitable picture of your subject. Place the tiff or jpeg image into your vector illustration file.
2. If it's a famous woman, ask yourself what does a 'normal' woman of a similar age and ethnicity look like? Draw a norm for your subject on a new layer. This can be done by drawing the essential features of a typical face (two eyes, nose, mouth, basic shape of hair, and so on). These features are then moved around inside the face outline to create 'configural relations' that feel neutral. The 'norm' will be different for each student depending on their experience of faces.
3. Using the layers option in your illustration software, overlay the subject with your norm.
4. Notice the differences between the two faces, and, on a new layer, exaggerate these differences even further away from where the features appear on your norm. E.g. If the eyes are closer together than in your norm, make them closer still. If the nose is further away from the mouth than is the case in your norm, make that distance even greater.
5. Remove source material and norm illustration (or simply switch off those layers) to reveal your caricature. You can also apply colour in a way that exaggerates what you see in the photograph.

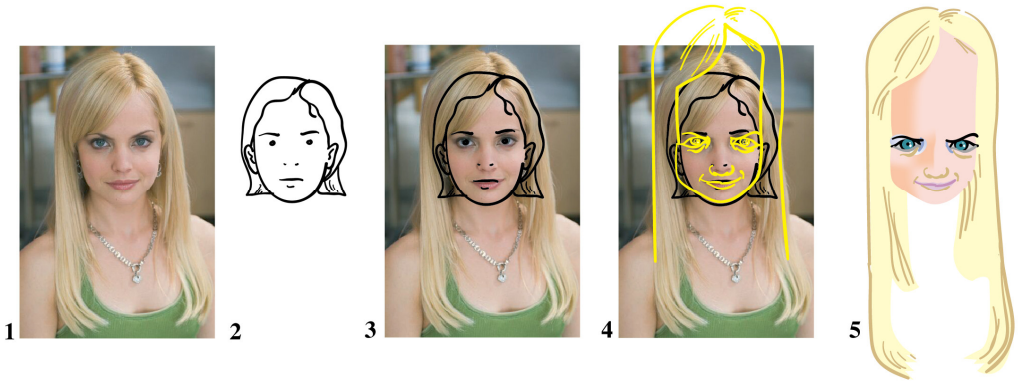

Figure 2: Sequence to construct caricature. The subject shown is the actress Mena Suvari.

Conclusions

Caricature, which seems almost a kind of visual magic, can actually be formulated down to a method which students with no previous experience in this style of picture making can understand, adopt and apply to create editorial illustrations. Students begin to understand that the level of realism has an impact upon the viewer's perception of an image and its associated text. They can make decisions about using caricatured portraits against realistic backgrounds for example. Outcomes from the research and the teaching have included a business magazine (*HD Magazine*) written by ECU journalism students. The pictorial content for the magazine is all illustrated using the vector software, and many of the profile portraits made for the magazine are built following the caricature instructions detailed here. Participating in this task allows the students to bring together theory, technical skills and written rationalisation of the intended message (Figure 3). We insist on the connection between the three by specifying in the project brief that the student's rationale is an assessable component of the project.

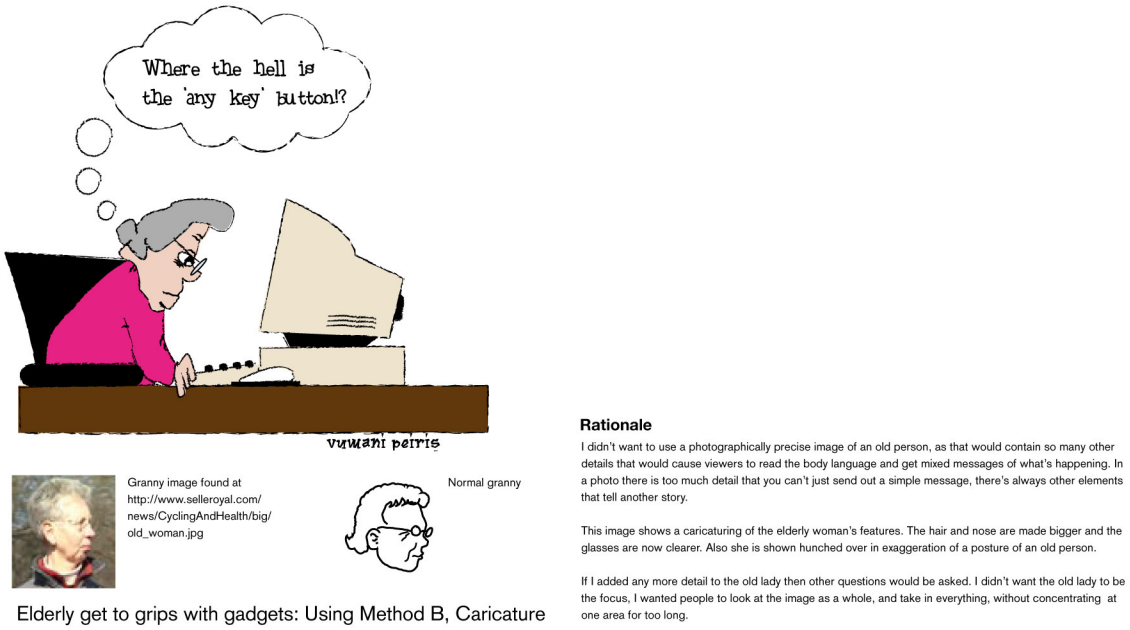

Figure 3: Vuwani Pereis, *Elderly get to grips with gadgets*. Final caricature, source image, drawn 'norm' and rationale

The mechanical approach detailed above often helps students feel at ease with the process of caricature and allows them to more easily pursue alternative techniques for caricature construction such as exaggeration of internal qualities or fusing features that express commentary on the subject. As well as strengthening their persuasive skills (for future commercial work for editors and clients), this gives us the opportunity to see where students are struggling with the task, and often gives us further insights into the more expressive or intuitive aspects of caricature making.

References

Brennan, S.E. (1985). The caricature generator. *Leonardo*, 18(3) (pp.170-178).

Dwyer, F. M. (1972). *A guide for improving visualized instruction*. Pennsylvania: Learning Services, State College, PA.

Fantz, R. (1961). The origin of form perception. *Scientific American,* 204, (pp.66-72).

Gropper, G. L. (1963). Why is a picture worth a thousand words? *AV Communication Review*, 11, (pp.75-79).

Knowlton, J. (1966). On the definition of a picture. *AV Communication Review* 14, (pp.147-183).

McCloud, S. (1993). *Understanding Comics, the Invisible Art*. New York: HarperCollins.

Rhodes, G. (1996). *Superportraits: Caricatures and recognition*. East Sussex, England: Psychology Press.

Walsh, V. & Kulikowski, J. (1998), (Eds.). *Perceptual Constancy: Why Things Look as They Do*. Cambridge: Cambridge University Press.